
# Appendix G.1

Surface Water Baseline Analytical Results
Completed for the Updated 2021 Beaver Dam Mine EIS

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | | | | SW-1D (DUP) | | | | | |
| Anion Sum | me/L | | | | 0.140 | 0.170 | 0.100 | 0.120 | 0.120 | 0.060 | 0.0900 | 0.0800 | 0.0800 | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | | 14 | 16 | 10 | 12 | 13 | 6 | 8.0 | 9.0 | 10 | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.290 | 0.290 | 0.190 | 0.210 | 0.210 | 0.110 | 0.160 | 0.170 | 0.180 | 0.230 |
| Hardness (CaCO3) | mg/L | | | | 5.5 | 5.0 | 3.3 | 3.5 | 3.5 | 1.6 | 2.6 | 2.9 | 3.3 | 4.0 |
| Ion Balance (% Difference) | % | | | | 34.9 | 26.1 | 31.0 | 27.3 | 27.3 | 29.4 | 28.0 | 36.0 | 38.5 | 39.4 |
| Langelier Index (@ 20C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | | <0.050 | 0.061 | <0.050 | 0.087 | 0.080 | 0.052 | <0.050 | 0.062 | 0.051 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| **Inorganics** | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 5.1 | 5.8 | 3.4 | 4.0 | 4.2 | 1.9 | 3.1 | 2.6 | 2.8 | 3.7 |
| Colour | TCU | | | | 150 | 160 | 99 | 83 | 100 | 85 | 110 | 170 | 160 | 230 |
| Nitrate + Nitrite | mg/L | | | | <0.050 | 0.061 | <0.050 | 0.087 | 0.080 | 0.052 | <0.050 | 0.062 | 0.051 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[1] | | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.10 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 13 | 18 | 8.2 | 7.0 | 7.5 | 6.3 | 7.5 | 12 | 12 | 11 (1) |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 5.55 | 4.59 | 5.23 | 4.87 | 4.91 | 5.19 | 5.85 | 6.00 | 5.57 | 5.59 |
| Reactive Silica (SiO2) | mg/L | | | | 2.5 | 3.9 | 2.7 | 3.8 | 4.0 | 1.9 | 1.1 | 2.1 | 2.6 | 3.2 |
| Dissolved Sulphate (SO4) | mg/L | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 1.1 | 0.64 | 0.59 | 0.62 | 0.69 | 0.76 | 1.1 | 1.2 | 1.1 | 1.2 |
| Conductivity | uS/cm | | | | 30 | 33 | 25 | 27 | 27 | 14 | 16 | 17 | 18 | 21 |
| Total Suspended Solids | | | | | - | - | - | - | - | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | |
| Temperature | °C | | | | 15.57 | 8 | 4.2 | 0.16 | - | 3.62 | 19.14 | 19.69 | 19.90 | - |
| Conductivity | µS/cm | | | | 39 | 36 | 26.7 | 25 | - | 16 | 22 | 24 | - | - |
| Total Dissolved Solids | g/L | | | | 0.031 | 0.035 | - | 0.029 | - | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[2] | | | 9.99 | 14.31 | 13.32 | 37.9 | - | 14.97 | 10.63 | 9.6 | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 3.97 | 2.63 | 4.1 | 2.89 | - | 6.48 | 5.25 | 5.49 | 5.3 | - |

**Notes**

CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference)

MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference)

MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-2A | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | | | SW-2AD (DUP) | | | | SW-2AD (DUP) | | | |
| Anion Sum | me/L | | | | 0.150 | 0.180 | 0.100 | 0.110 | 0.130 | 0.0500 | 0.0900 | 0.0900 | 0.0800 | 0.0800 | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | | 14 | 17 | 10 | 10 | 13 | 6.0 | 7.0 | 7.0 | 8.0 | 9.0 | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.290 | 0.300 | 0.180 | 0.180 | 0.210 | 0.110 | 0.140 | 0.140 | 0.160 | 0.180 | 0.220 |
| Hardness (CaCO3) | mg/L | | | | 5.1 | 4.9 | 2.9 | 2.8 | 3.4 | 1.4 | 2.1 | 2.0 | 2.6 | 2.9 | 3.6 |
| Ion Balance (% Difference) | % | | | | 31.8 | 25.0 | 28.6 | 24.1 | 23.5 | 37.5 | 21.7 | 21.7 | 33.3 | 38.5 | 37.5 |
| Langelier Index (@ 20C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | | 0.11 | 0.065 | <0.050 | <0.050 | 0.079 | <0.050 | <0.050 | <0.050 | 0.055 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | | | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| **Inorganics** | | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 5.0 | 6.3 | 3.6 | 3.8 | 4.2 | 1.6 | 3.1 | 3.1 | 2.8 | 2.8 | 3.7 |
| Colour | TCU | | | | 160 | 160 | 100 | 100 | 110 | 96 | 120 | 120 | 170 | 180 | 230 |
| Nitrate + Nitrite | mg/L | | | | 0.11 | 0.065 | <0.050 | <0.050 | 0.079 | <0.050 | <0.050 | <0.050 | 0.055 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[1] | | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.052 | <0.050 | <0.050 | <0.050 | 0.084 |
| Total Organic Carbon (C) | mg/L | | | | 14 | 19 | 8.9 | 9.1 | 7.4 | 5.5 | 7.9 | 8.1 | 12 | 13 | 14 (1) |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 5.06 | 4.54 | 4.88 | 4.75 | 4.75 | 5.08 | 5.59 | 5.36 | 5.29 | 5.26 | 5.16 |
| Reactive Silica (SiO2) | mg/L | | | | 2.7 | 3.9 | 2.8 | 2.7 | 3.7 | 1.9 | 1.1 | 1.1 | 1.9 | 2.6 | 3.2 |
| Dissolved Sulphate (SO4) | mg/L | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 1.1 | 0.50 | 0.59 | 0.23 | 0.70 | 0.29 | 1.5 | 1.4 | 0.99 | 0.97 | 1.9 |
| Conductivity | uS/cm | | | | 31 | 33 | 25 | 25 | 28 | 13 | 16 | 15 | 17 | 19 | 21 |
| Total Suspended Solids | | | | | - | - | - | - | - | - | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | | |
| Temperature | °C | | | | 13.57 | 7.89 | 4.2 | - | 0.27 | 3.34 | 20.64 | - | 18.81 | 21.2 | - |
| Conductivity | µS/cm | | | | 38 | 37 | 27.4 | - | 25 | 16 | 23 | - | 24 | - | - |
| Total Dissolved Solids | g/L | | | | 0.031 | 0.036 | - | - | 0.03 | | | - | | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[2] | | | 8.97 | 13.07 | 12.88 | - | 36.14 | 15.35 | 9.91 | - | 9.18 | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 4.09 | 3.08 | 3.75 | - | 3.56 | 6.53 | 4.63 | - | 4.00 | 4.94 | - |

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(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-4A | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **13-Nov-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | | SW-4AD (DUP) | | No Sample | | | | | |
| Anion Sum | me/L | | | | 0.150 | 0.180 | 0.180 | 0.110 | | 0.0400 | 0.110 | 0.0700 | 0.0700 | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | | 15 | 16 | 16 | 11 | | 6.0 | 9.0 | 8.0 | 9.0 | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.300 | 0.300 | 0.300 | 0.200 | | 0.120 | 0.180 | 0.170 | 0.190 | 0.230 |
| Hardness (CaCO3) | mg/L | | | | 5.9 | 5.6 | 5.6 | 3.5 | | 1.6 | 3.1 | 3.0 | 3.6 | 3.9 |
| Ion Balance (% Difference) | % | | | | 33.3 | 25.0 | 25.0 | 29.0 | | 50.0 | 24.1 | 41.7 | 46.2 | 35.3 |
| Langelier Index (@ 20C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | | 0.093 | 0.062 | <0.050 | <0.050 | | <0.050 | <0.050 | 0.064 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| **Inorganics** | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | <5.0 | <5.0 | <5.0 | <5.0 | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 5.0 | 6.2 | 6.4 | 3.9 | | 1.3 | 3.8 | 2.2 | 2.6 | 3.7 |
| Colour | TCU | | | | 120 | 130 | 130 | 88 | | 100 | 130 | 160 | 170 | 260 |
| Nitrate + Nitrite | mg/L | | | | 0.093 | 0.062 | <0.050 | <0.050 | | <0.050 | <0.050 | 0.064 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | | <0.050 | <0.050 | <0.050 | <0.050 | | 0.073 | 0.092 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 9.3 | 16 | 16 | 8.2 | | 5.5 | 9.7 | 12 | 18 | 14 (1) |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 5.57 | 4.76 | 4.71 | 4.96 | | 5.14 | 5.74 | 5.42 | 5.09 | 4.93 |
| Reactive Silica (SiO2) | mg/L | | | | 3.4 | 3.5 | 3.6 | 2.9 | | 2.5 | 1.5 | 2.0 | 2.3 | 3.0 |
| Dissolved Sulphate (SO4) | mg/L | | | | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 1.4 | 0.68 | 0.65 | 0.80 | | 0.38 | 1.4 | 1.3 | 0.81 | 1.0 |
| Conductivity | uS/cm | | | | 29 | 31 | 31 | 24 | | 15 | 18 | 17 | 19 | 21 |
| Total Suspended Solids | | | | | - | - | - | - | | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | |
| Temperature | °C | | | | 10.85 | 8.98 | - | 5.1 | | 5.98 | 22.45 | 20.72 | 22.4 | - |
| Conductivity | µS/cm | | | | 34 | 35 | - | 24.9 | | 31 | 27 | 32 | - | - |
| Total Dissolved Solids | g/L | | | | 0.03 | 0.033 | - | - | | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[(2)] | | | 7.11 | 10.4 | - | 7.82 | | 13.48 | 7.88 | 6.8 | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 4.27 | 3.71 | - | 3.75 | | 6.56 | 5.34 | 5.34 | 4.92 | - |

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | SW-5D (DUP) | | | | | | | | |
| Anion Sum | me/L | | | | 0.480 | 0.480 | 0.520 | 0.340 | 0.400 | 0.100 | 0.360 | 0.350 | 0.360 | 0.410 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | 14 | 14 | 11 | 6.1 | 8.0 | <1.0 | 7.8 | 9.3 | 11 | 13 |
| Calculated TDS | mg/L | | | | 28 | 28 | 33 | 23 | 27 | 12 | 21 | 21 | 21 | 25 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.480 | 0.470 | 0.510 | 0.340 | 0.430 | 0.240 | 0.350 | 0.350 | 0.340 | 0.420 |
| Hardness (CaCO3) | mg/L | | | | 16 | 16 | 17 | 10 | 14 | 7.3 | 11 | 12 | 12 | 15 |
| Ion Balance (% Difference) | % | | | | 0.00 | 1.05 | 0.970 | 0.00 | 3.61 | 41.2 | 1.41 | 0.00 | 2.86 | 1.20 |
| Langelier Index (@ 20C) | N/A | | | | (2.56) | (2.54) | -2.74 | -3.79 | -3.17 | NC | -3.22 | -3.00 | -2.84 | -2.55 |
| Langelier Index (@ 4C) | N/A | | | | (2.81) | (2.80) | -2.99 | -4.04 | -3.42 | NC | -3.48 | -3.26 | -3.09 | -2.80 |
| Nitrate (N) | mg/L | **2.935** | | | 0.10 | 0.15 | 0.051 | 0.094 | 0.096 | 0.870 | <0.050 | 0.063 | <0.050 | 0.055 |
| Saturation pH (@ 20C) | N/A | | | | 9.43 | 9.46 | 9.52 | 10.0 | 9.77 | NC | 9.84 | 9.76 | 9.66 | 9.50 |
| Saturation pH (@ 4C) | N/A | | | | 9.69 | 9.71 | 9.77 | 10.3 | 10.0 | NC | 10.1 | 10.0 | 9.92 | 9.75 |
| **Inorganics** | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | 14 | 14 | 11 | 6.1 | 8.0 | <5.0 | 7.8 | 9.3 | 11 | 13 |
| Dissolved Chloride (Cl) | mg/L | | | | 4.0 | 4.1 | 5.2 | 4.0 | 5.0 | 1.5 | 3.4 | 1.9 | 1.7 | 2.2 |
| Colour | TCU | | | | 22 | 23 | 26 | 30 | 23 | 28 | 27 | 23 | 24 | 37 |
| Nitrate + Nitrite | mg/L | | | | 0.10 | 0.15 | 0.051 | 0.094 | 0.096 | 0.087 | <0.050 | 0.063 | <0.050 | 0.055 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[1] | | | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.052 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 4.1 | 4.3 | 3.5 | 4.0 | 3.1 | 3.5 | 3.6 | 4.1 | 5.3 | 4.3 |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.011 | <0.010 | <0.010 | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 6.88 | 6.92 | 6.78 | 6.23 | 6.60 | 6.14 | 6.62 | 6.76 | 6.83 | 6.95 |
| Reactive Silica (SiO2) | mg/L | | | | 1.8 | 1.8 | 3.1 | 3.0 | 3.1 | 2.3 | <0.50 | 0.92 | 0.77 | 2.5 |
| Dissolved Sulphate (SO4) | mg/L | | | | 3.5 | 3.6 | 7.0 | 4.6 | 4.4 | 2.5 | 5.0 | 5.0 | 4.5 | 3.6 |
| Turbidity | NTU | | | | 0.44 | 0.81 | 1.4 | 6.2 | 2.4 | 0.69 | 1.2 | 0.83 | 0.91 | 1.2 |
| Conductivity | uS/cm | | | | 48 | 47 | 49 | 35 | 45 | 28 | 34 | 35 | 32 | 40 |
| Total Suspended Solids | | | | | - | - | - | - | - | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | |
| Temperature | °C | | | | 13.98 | - | 7.76 | 4.6 | 1.75 | 2.7 | 20.84 | 20.51 | 22.4 | - |
| Conductivity | µS/cm | | | | 53 | - | 49 | 35.7 | 36 | 27 | 40 | 40 | - | - |
| Total Dissolved Solids | g/L | | | | 0.044 | - | 0.048 | - | 0.041 | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[2] | | | 8.26 | - | 15.04 | 13.08 | 39.05 | 14.95 | 8.59 | 9.13 | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 5.46 | - | 4.61 | 5.94 | 4.8 | 6.67 | 6.56 | 6.34 | 6.39 | - |

**Notes**

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-6A | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | | | | No Sample | | | SW-6AD (DUP) | | |
| Anion Sum | me/L | | | | 0.130 | 0.160 | 0.110 | 0.120 | | 0.0700 | 0.0700 | 0.0700 | 0.0700 | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | | 13 | 15 | 11 | 12 | | 7.0 | 7.0 | 7.0 | 8.0 | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.240 | 0.270 | 0.190 | 0.210 | | 0.140 | 0.170 | 0.160 | 0.170 | 0.240 |
| Hardness (CaCO3) | mg/L | | | | 4.5 | 5.0 | 3.5 | 3.9 | | 2.5 | 2.8 | 2.8 | 3.2 | 4.4 |
| Ion Balance (% Difference) | % | | | | 29.7 | 25.6 | 26.7 | 27.3 | | 33.3 | 41.7 | 39.1 | 41.7 | 41.2 |
| Langelier Index (@ 20C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | | 0.080 | <0.050 | <0.050 | <0.050 | | <0.050 | 0.053 | 0.059 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | | | | NC | NC | NC | NC | | NC | NC | NC | NC | NC |
| **Inorganics** | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | <5.0 | <5.0 | <5.0 | <5.0 | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 4.3 | 5.8 | 3.8 | 4.2 | | 2.5 | 2.2 | 2.2 | 2.4 | 3.5 |
| Colour | TCU | | | | 80 | 99 | 87 | 82 | | 88 | 140 | 130 | 140 | 220 |
| Nitrate + Nitrite | mg/L | | | | 0.080 | <0.050 | <0.050 | <0.050 | | <0.050 | 0.053 | 0.059 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | | <0.050 | <0.050 | <0.050 | <0.050 | | <0.050 | 0.22 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 9.1 | 13 | 8.1 | 8.9 | | 7.3 | 10 | 11 | 13 | 12 (1) |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 5.73 | 5.05 | 5.13 | 5.09 | | 5.76 | 5.79 | 5.64 | 5.50 | 5.37 |
| Reactive Silica (SiO2) | mg/L | | | | 3.3 | 3.5 | 2.8 | 3.4 | | 1.1 | 1.3 | 1.2 | 1.6 | 2.7 |
| Dissolved Sulphate (SO4) | mg/L | | | | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 0.30 | 0.69 | 0.42 | 0.44 | | 0.43 | 0.65 | 1.1 | 0.49 | 0.54 |
| Conductivity | uS/cm | | | | 25 | 28 | 24 | 25 | | 16 | 16 | 16 | 16 | 20 |
| Total Suspended Solids | | | | | - | - | - | - | | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | |
| Temperature | °C | | | | 10.98 | 8.04 | 4.6 | 1.15 | | 17.4 | 18.09 | - | 20.4 | - |
| Conductivity | µS/cm | | | | 31 | 32 | 25.7 | 23 | | 34 | 22 | - | - | - |
| Total Dissolved Solids | g/L | | | | 0.028 | 0.032 | - | 0.027 | | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[(2)] | | | 8.88 | 14.49 | 12.01 | 42.34 | | 10.89 | 9.17 | - | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 3.56 | 3.43 | 4.49 | 3.98 | | 5.72 | 8.73 | - | 5.02 | - |

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-9 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **29-Jul-15** | **24-Aug-15** |
| **Calculated Parameters** | **Units** | | | | | | | | | | | | SW-9 (DUP) | |
| Anion Sum | me/L | | | | 0.310 | 0.200 | 0.140 | 0.180 | 0.100 | 0.170 | 0.130 | 0.250 | 0.250 | 0.150 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | 5.8 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 5.6 | 5.5 | <1.0 |
| Calculated TDS | mg/L | | | | 23 | 17 | 12 | 16 | 9 | 13 | 13 | 18 | 18 | 15 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.420 | 0.340 | 0.230 | 0.290 | 0.180 | 0.260 | 0.310 | 0.330 | 0.340 | 0.330 |
| Hardness (CaCO3) | mg/L | | | | 10 | 6.4 | 4.1 | 5.0 | 2.8 | 4.7 | 7.4 | 8.0 | 8.2 | 7.5 |
| Ion Balance (% Difference) | % | | | | 15.1 | 25.9 | 24.3 | 23.4 | 28.6 | 20.9 | 40.9 | 13.8 | 15.3 | 37.5 |
| Langelier Index (@ 20C) | N/A | | | | (4.22) | NC | NC | NC | NC | NC | NC | -3.90 | -3.83 | NC |
| Langelier Index (@ 4C) | N/A | | | | (4.47) | NC | NC | NC | NC | NC | NC | -4.16 | -4.08 | NC |
| Nitrate (N) | mg/L | **2.935** | | | 0.091 | <0.050 | <0.050 | 0.051 | <0.050 | <0.050 | <0.050 | 0.064 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | 10.2 | NC | NC | NC | NC | NC | NC | 10.3 | 10.3 | NC |
| Saturation pH (@ 4C) | N/A | | | | 10.4 | NC | NC | NC | NC | NC | NC | 10.5 | 10.5 | NC |
| **Inorganics** | | | | | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | 5.8 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 5.6 | 5.5 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 6.7 | 7.2 | 4.8 | 6.2 | 3.4 | 6.1 | 4.8 | 4.8 | 4.9 | 5.4 |
| Colour | TCU | | | | 160 | 140 | 110 | 73 | 82 | 80 | 150 | 130 | 130 | 180 |
| Nitrate + Nitrite | mg/L | | | | 0.091 | <0.050 | <0.050 | 0.051 | <0.050 | <0.050 | <0.050 | 0.064 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[1] | | | <0.050 | <0.050 | <0.050 | <0.050 | 0.082 | <0.050 | 0.14 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 17 | 18 | 8.9 | 7.0 | 6.1 | 6.7 | 12 | 12 | 12 | 11 (1) |
| Orthophosphate (P) | mg/L | | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 5.94 | 4.96 | 5.06 | 5.44 | 5.77 | 6.17 | 6.33 | 6.36 | 6.43 | 6.05 |
| Reactive Silica (SiO2) | mg/L | | | | 3.2 | 3.1 | 2.4 | 3.5 | 1.6 | 1.5 | 2.2 | 2.7 | 2.6 | 2.3 |
| Dissolved Sulphate (SO4) | mg/L | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 1.5 | 0.74 | 0.49 | 0.77 | 1.0 | 0.72 | 0.99 | 1.0 | 0.93 | 0.82 |
| Conductivity | uS/cm | | | | 39 | 35 | 27 | 32 | 19 | 29 | 29 | 30 | 30 | 29 |
| Total Suspended Solids | | | | | - | - | - | - | - | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | | | | | |
| Temperature | °C | | | | 16.03 | 7.84 | 4 | 0.07 | 2.72 | 20.69 | 18.96 | 20.3 | - | - |
| Conductivity | µS/cm | | | | 47 | 36 | 28.2 | 26 | 20 | 34 | 34 | - | - | - |
| Total Dissolved Solids | g/L | | | | 0.037 | 0.037 | - | 0.033 | | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[2] | | | 9.82 | 12.85 | 12.34 | 21.9 | 15.27 | 10.89 | 9.9 | - | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 4.90 | 3.17 | 4.66 | 3.68 | 6.6 | 5.72 | 8.04 | 6.14 | - | - |

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(1) Ammonia guideline dependent on temperature and pH, *e.g.* , if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet).

(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

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NC = not calculated

**Table G.1-1: General Chemistry**

| | | CCME FAL | MMER | MDMER | SW-10 | | | | SW-11 | SW-12 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** | **24-Aug-15** | **5-Oct-17** | **Oct-5-2017** |
| **Calculated Parameters** | **Units** | | | | | | | SW-10 (DUP) | | |
| Anion Sum | me/L | | | | 0.450 | 0.580 | 0.770 | 0.780 | 0.150 | 0.130 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | | 8.0 | 11 | 25 | 25 | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | | 32 | 39 | 55 | 55 | 15 | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | | | | 0.450 | 0.510 | 0.960 | 0.960 | 0.250 | 0.230 |
| Hardness (CaCO3) | mg/L | | | | 15 | 20 | 30 | 30 | 4.9 | 4.1 |
| Ion Balance (% Difference) | % | | | | 0.00 | 6.42 | 11.0 | 10.3 | 25.0 | 27.8 |
| Langelier Index (@ 20C) | N/A | | | | -3.05 | -3.09 | -2.67 | -2.60 | NC | NC |
| Langelier Index (@ 4C) | N/A | | | | -3.31 | -3.35 | -2.92 | -2.85 | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | | 0.060 | 0.070 | <0.050 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | | 9.70 | 9.46 | 8.91 | 8.91 | NC | NC |
| Saturation pH (@ 4C) | N/A | | | | 9.96 | 9.71 | 9.16 | 9.16 | NC | NC |
| **Inorganics** | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | | 8.0 | 11 | 25 | 25 | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | | 2.9 | 2.2 | 2.9 | 3.1 | 5.3 | 4.6 |
| Colour | TCU | | | | 9.4 | <5.0 | 100 | 110 | 230 (1) | 170 (1) |
| Nitrate + Nitrite | mg/L | | | | 0.060 | 0.070 | <0.050 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | | <0.050 | <0.050 | 0.10 | 0.19 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | | 2.1 | 1.8 | 7.6 | 7.4 | 24 (1) | 23.0 |
| Orthophosphate (P) | mg/L | | | | <0.010 | 0.012 | 0.064 | 0.064 | <0.010 | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | **6-9.5** | 6.65 | 6.37 | 6.24 | 6.31 | 5.65 | 5.30 |
| Reactive Silica (SiO2) | mg/L | | | | 4.7 | 6.0 | 7.0 | 7.0 | 3.9 | 3.5 |
| Dissolved Sulphate (SO4) | mg/L | | | | 9.6 | 14 | 8.8 | 8.9 | <2.0 | <2.0 |
| Turbidity | NTU | | | | 1.0 | <0.10 | 10 | 8.3 | 1.3 | 0.67 |
| Conductivity | uS/cm | | | | 46 | 54 | 75 | 76 | 34 | 35 |
| Total Suspended Solids | | | | | - | - | - | - | - | - |
| **Field Parameters** | | | | | | | | | | |
| Temperature | °C | | | | 14.14 | 17.6 | - | - | - | - |
| Conductivity | µS/cm | | | | 51 | - | - | - | - | - |
| Total Dissolved Solids | g/L | | | | - | - | - | - | - | - |
| Dissolved Oxygen | mg/L | **5.5-9.5**[(2)] | | | 11.8 | - | - | - | - | - |
| pH | | **6.5-9** | **6-9.5** | **6-9.5** | 6.55 | 5.88 | - | - | - | - |

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(2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table).

- denotes not analyzed

NC = not calculated

**Table G.1-1: Metals**

| | | | | | | SW-1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | **CCME FAL** | **Tier 1 EQS** | **MMER** | **MDMER** | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | | | | SW-1D (DUP) | | | | | |
| Total Aluminum (Al) | ug/L | **5 / 100[(1)]** | **5** | | | 330 | 320 | 220 | 200 | 200 | 140 | 190 | 280 | 280 | 400 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 2.7 | 1.5 | 1.3 | <1.0 | <1.0 | <1.0 | 2.6 | 2.5 | 3.7 | 1.3 |
| Total Barium (Ba) | ug/L | | **1000** | | | 5.8 | 5.6 | 3.1 | 3.3 | 3.4 | 1.7 | 2.4 | 3.0 | 3.2 | 4.6 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37[(2)]** | **0.04** | | | 0.024 | 0.029 | 0.023 | 0.012 | 0.022 | 0.012 | <0.010 | 0.028 | 0.014 | 0.022 |
| Total Calcium (Ca) | ug/L | | | | | 1200 | 1100 | 780 | 720 | 740 | 350 | 630 | 690 | 790 | 770 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | <1.0 | 1.6 | <1.0 | <1.0 | 3.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | 0.51 | 0.52 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 0.53 |
| Total Copper (Cu) | ug/L | **2 - 4[(3)]** | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 670 | 630 | 330 | 350 | 340 | 240 | 360 | 580 | 750 | 1000 |
| Total Lead (Pb) | ug/L | **1 - 7[(4)]** | **1** | **400** | **400** | 0.51 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.54 | <0.50 | 0.57 |
| Total Magnesium (Mg) | ug/L | | | | | 590 | 560 | 330 | 400 | 410 | 170 | 240 | 290 | 310 | 420 |
| Total Manganese (Mn) | ug/L | | **820** | | | 79 | 68 | 41 | 51 | 53 | 27 | 31 | 37 | 43 | 58 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | 0.015 | <0.013 | <0.013 | 0.032 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150[(5)]** | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | 2.6 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | 150 | 170 | 140 |
| Total Potassium (K) | ug/L | | | | | 570 | 550 | 380 | 380 | 370 | 330 | 340 | 170 | 210 | 170 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 3100 | 3000 | 2100 | 2300 | 2400 | 1200 | 1800 | 1900 | 1900 | 2300 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 11.0 | 10 | 5.8 | 6.3 | 6.6 | 2.9 | 4.6 | 5.9 | 6.3 | 7.4 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | 3.8 | 3.2 | 3.3 | 2.4 | 2.2 | 3.2 | 2.7 | 3.7 | 3.7 | 5.0 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | 2.3 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | 5.0 | 5.1 | 7.8 | <5.0 | <5.0 | <5.0 | 6.8 | <5.0 | <5.0 | <5.0 |

**Notes**

CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference)

Tier 1 EQS - Nova Scotia Environment Tier 1 Environmental Quality Standards for Freshwater Surface Water (provided for reference)

MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference)

MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{[0.83(\log[\text{hardness}])-2.46]}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | CCME FAL | Tier 1 EQS | MMER | MDMER | SW-2A | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | | | SW-2AD (DUP) | . | | | SW-2AD (DUP) | | | |
| Total Aluminum (Al) | ug/L | **5 / 100[(1)]** | **5** | | | 330 | 340 | 210 | 210 | 210 | 140 | 190 | 190 | 280 | 300 | 400 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 | 1.1 | <1.0 | 1.5 | 1.3 |
| Total Barium (Ba) | ug/L | | **1000** | | | 5.6 | 5.8 | 3.2 | 3.0 | 3.3 | 1.6 | 2.2 | 2.2 | 3.0 | 3.5 | 4.6 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37[(2)]** | **0.04** | | | 0.026 | 0.028 | 0.017 | 0.017 | 0.013 | <0.010 | 0.013 | 0.013 | 0.012 | 0.017 | 0.022 |
| Total Calcium (Ca) | ug/L | | | | | 1100 | 1000 | 640 | 590 | 680 | 290 | 470 | 460 | 580 | 620 | 770 |
| Total Chromium (Cr) | ug/L | | | | | 1.4 | 1.6 | <1.0 | <1.0 | <1.0 | 1.2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | 0.49 | 0.58 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 0.53 |
| Total Copper (Cu) | ug/L | **2 - 4[(3)]** | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 740 | 700 | 360 | 350 | 340 | 260 | 410 | 400 | 590 | 820 | 1000 |
| Total Lead (Pb) | ug/L | **1 - 7[(4)]** | **1** | **400** | **400** | 0.78 | 0.55 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.55 | 0.62 | 0.57 |
| Total Magnesium (Mg) | ug/L | | | | | 570 | 570 | 320 | 310 | 410 | 160 | 220 | 210 | 280 | 330 | 420 |
| Total Manganese (Mn) | ug/L | | **820** | | | 77 | 71 | 43 | 42 | 51 | 25 | 27 | 27 | 35 | 40 | 58 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | 0.013 | 0.013 | <0.013 | <0.013 | 0.035 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150[(5)]** | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | 110 | <100 | <100 | <100 | <100 | <100 | <100 | 150 | 170 | 140 |
| Total Potassium (K) | ug/L | | | | | 600 | 600 | 370 | 340 | 380 | 330 | 290 | 290 | 160 | 200 | 170 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 3100 | 3100 | 2100 | 2000 | 2400 | 1200 | 1600 | 1600 | 1900 | 1900 | 2300 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 11.0 | 9.5 | 5.6 | 5.2 | 6.6 | 3.0 | 4.1 | 3.9 | 5.0 | 6.3 | 7.4 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | 4.2 | 3.8 | 2.6 | 2.6 | 2.2 | 3.2 | 2.0 | 2.4 | 3.6 | 4.6 | 5.0 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | 2.5 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | 6.9 | 6.2 | 5.5 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

**Notes**

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | | | | | SW-4A | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | **CCME FAL** | **Tier 1 EQS** | **MMER** | **MDMER** | **9-Oct-14** | **13-Nov-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | | SW-4AD (DUP) | | No Sample | | | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | **5** | | | 250 | 300 | 310 | 220 | | 130 | 240 | 300 | 350 | 390 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 5.8 | 2.9 | 2.8 | 2.0 | | 1.1 | 7.3 | 5.4 | 5.6 | 5.6 |
| Total Barium (Ba) | ug/L | | **1000** | | | 3.4 | 4.6 | 4.4 | 3.2 | | 1.7 | 2.8 | 2.8 | 3.7 | 3.4 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | **0.04** | | | 0.015 | 0.024 | 0.025 | 0.044 | | 0.012 | 0.013 | 0.016 | 0.014 | 0.021 |
| Total Calcium (Ca) | ug/L | | | | | 1500 | 1300 | 1300 | 810 | | 350 | 780 | 710 | 860 | 930 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | 0.43 | 0.53 | 0.59 | <0.40 | | <0.40 | 0.42 | <0.40 | 0.63 | 0.48 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 690 | 540 | 540 | 320 | | 160 | 580 | 650 | 840 | 1100 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **1** | **400** | **400** | 0.54 | <0.50 | <0.50 | <0.50 | | <0.50 | <0.50 | 0.52 | 0.56 | 0.55 |
| Total Magnesium (Mg) | ug/L | | | | | 540 | 590 | 590 | 350 | | 170 | 280 | 290 | 360 | 370 |
| Total Manganese (Mn) | ug/L | | **820** | | | 53 | 58 | 58 | 41 | | 20 | 37 | 32 | 42 | 51 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | | <0.013 | 0.015 | <0.013 | <0.013 | 0.028 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | 100 | 100 | <100 | | <100 | <100 | 140 | 150 | 150 |
| Total Potassium (K) | ug/L | | | | | 450 | 500 | 520 | 480 | | 290 | 280 | 140 | 180 | 200 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 3200 | 3100 | 3200 | 2300 | | 1300 | 1900 | 1900 | 1700 | 2200 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 10 | 9.1 | 9.2 | 5.7 | | 2.8 | 5.1 | 5.0 | 6.4 | 7.2 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | 5 | 3.7 | 3.9 | 2.3 | | 2.4 | 4.7 | 3.8 | 3.8 | 4.9 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | <0.10 | <0.10 | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | 2.9 | 2.8 | <2.0 | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | 19 | 7.8 | 6.9 | 12 | | <5.0 | 7.5 | <5.0 | <5.0 | 6.0 |

**Notes**

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | CCME FAL | Tier 1 EQS | MMER | MDMER | SW-5 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | **9-Oct-14** | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | SW-5D (DUP) | | | | | | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | **5** | | | 28 | 29 | 100 | 460 | 210 | 98 | 61 | 45 | 43 | 52 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 29 | 30 | 15 | 17 | 22 | 15 | 41 | 32 | 20 | 47 |
| Total Barium (Ba) | ug/L | | **1000** | | | 4.5 | 4.6 | 5.5 | 6.1 | 6.1 | 4.6 | 4.4 | 3.6 | 4.1 | 4.5 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | **0.04** | | | <0.010 | 0.016 | <0.010 | 0.010 | 0.011 | 0.018 | <0.010 | <0.010 | <0.010 | <0.010 |
| Total Calcium (Ca) | ug/L | | | | | 5000 | 4900 | 5300 | 3000 | 4100 | 2200 | 3500 | 3600 | 3800 | 4500 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | <1.0 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | <0.40 | <0.40 | <0.40 | <0.40 | 0.44 | 0.61 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 400 | 400 | 470 | 730 | 680 | 560 | 880 | 530 | 610 | 750 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **1** | **400** | **400** | <0.50 | <0.50 | <0.50 | 0.57 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | | | | | 940 | 920 | 970 | 640 | 780 | 430 | 600 | 640 | 720 | 870 |
| Total Manganese (Mn) | ug/L | | **820** | | | 60 | 59 | 28 | 25 | 150 | 200 | 65 | 50 | 45 | 97 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | 0.015 | <0.013 | <0.013 | 0.027 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | 140 | 170 | 150 |
| Total Potassium (K) | ug/L | | | | | 730 | 710 | 1000 | 720 | 740 | 480 | 670 | 580 | 350 | 450 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 2700 | 2700 | 2900 | 2200 | 2700 | 1400 | 1700 | 1800 | 1500 | 2000 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 28.0 | 27 | 26 | 15 | 21 | 11 | 18 | 20 | 25 | 27 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | <2.0 | <2.0 | 3.2 | 14 | 4.2 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | <2.0 | 3.1 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 5.4 | <5.0 | <5.0 | <5.0 | <5.0 |

**Notes**

CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference)

Tier 1 EQS - Nova Scotia Environment Tier 1 Environmental Quality Standards for Freshwater Surface Water (provided for reference)

MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference)

MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | CCME FAL | Tier 1 EQS | MMER | MDMER | SW-6A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **28-May-15** | **30-Jun-15** | **30-Jun-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | | | | | | SW-6AD (DUP) | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | **5** | | | 220 | 290 | 240 | 250 | 220 | 290 | 39 | 320 | 470 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 4.0 | 1.9 | 1.1 | 1.0 | 3.2 | 3.0 | 130 | 2.8 | 7.6 |
| Total Barium (Ba) | ug/L | | **1000** | | | 3.2 | 4.1 | 3.1 | 3.0 | 2.3 | 2.6 | 5.4 | 3.1 | 3.8 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | **0.04** | | | 0.024 | 0.021 | 0.014 | 0.011 | <0.010 | 0.016 | 0.061 | 0.012 | 0.031 |
| Total Calcium (Ca) | ug/L | | | | | 1000 | 1200 | 790 | 880 | 620 | 670 | 4900 | 770 | 1000 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | 1.3 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | <0.40 | 0.44 | <0.40 | <0.40 | <0.40 | <0.40 | 1.8 | <0.40 | 1.0 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 3.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 500 | 480 | 330 | 380 | 370 | 550 | 1400 | 750 | 1500 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **1** | **400** | **400** | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | | | | | 470 | 510 | 360 | 410 | 230 | 270 | 660 | 310 | 430 |
| Total Manganese (Mn) | ug/L | | **820** | | | 50 | 51 | 39 | 46 | 29 | 33 | 110 | 38 | 100 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | 0.017 | <0.013 | 0.013 | <0.013 | 0.035 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 7.2 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | <100 | <100 | <100 | <100 | 140 | 140 | 160 | 150 |
| Total Potassium (K) | ug/L | | | | | 340 | 470 | 300 | 300 | 280 | 190 | 640 | 200 | 240 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 2800 | 3000 | 2200 | 2300 | 1700 | 1800 | 1900 | 1700 | 2200 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 7.1 | 7.7 | 5.9 | 6.1 | 4.4 | 4.8 | 19 | 5.5 | 7.6 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | 2.7 | 3.1 | 2.8 | 2.6 | 2.8 | 3.4 | <2.0 | 3.5 | 4.3 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | 2.2 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | <5.0 | 5.5 | <5.0 | <5.0 | 5.7 | <5.0 | 13 | <5.0 | <5.0 |

**Notes**

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Tier 1 EQS - Nova Scotia Environment Tier 1 Environmental Quality Standards for Freshwater Surface Water (provided for reference)

MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference)

MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | | | | | SW-9 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | **CCME FAL** | **Tier 1 EQS** | **MMER** | **MDMER** | **9-Oct-14** | **13-Nov-14** | **18-Dec-14** | **22-Jan-15** | **29-Apr-15** | **28-May-15** | **30-Jun-15** | **29-Jul-15** | **29-Jul-15** | **24-Aug-15** |
| **Metals** | **Units** | | | | | | | | | | | | | SW-1 (DUP) | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | **5** | | | 410 | 330 | 310 | 210 | 160 | 170 | 280 | 260 | 270 | 320 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | | **1000** | | | 6.6 | 5.7 | 3.5 | 3.4 | 2.1 | 2.4 | 3.3 | 3.4 | 3.3 | 4.2 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | **0.04** | | | 0.024 | 0.025 | 0.019 | 0.010 | 0.014 | <0.010 | 0.014 | <0.010 | <0.010 | 0.015 |
| Total Calcium (Ca) | ug/L | | | | | 2300 | 1400 | 890 | 1100 | 640 | 1100 | 1700 | 1800 | 1900 | 1700 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1.3 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **2** | **600** | **600** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 620 | 500 | 280 | 290 | 220 | 210 | 440 | 490 | 510 | 580 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **1** | **400** | **400** | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | | | | | 1100 | 700 | 450 | 530 | 300 | 480 | 740 | 830 | 840 | 810 |
| Total Manganese (Mn) | ug/L | | **820** | | | 140 | 75 | 51 | 51 | 36 | 34 | 57 | 56 | 60 | 76 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | 0.013 | <0.013 | <0.013 | 0.013 | 0.032 |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **25** | **1000** | **1000** | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | <100 | <100 | <100 | <100 | <100 | <100 | 150 | 160 | 170 | 160 |
| Total Potassium (K) | ug/L | | | | | 640 | 530 | 340 | 350 | 300 | 270 | 200 | 210 | 240 | 180 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 4000 | 3900 | 2900 | 3900 | 2400 | 3500 | 3100 | 3300 | 3500 | 3500 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 10 | 7.7 | 5.0 | 5.6 | 2.8 | 4.2 | 5.9 | 6.5 | 5.9 | 6.6 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | 4.8 | 4.1 | 3.5 | 2.8 | 3.1 | 3.0 | 3.1 | 3.6 | 4.9 | 4.3 |
| Total Uranium (U) | ug/L | **15** | **300** | | | 0.11 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.12 | 0.13 | 0.11 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | 2.3 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | 5.2 | 7.5 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |

**Notes**

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MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**Table G.1-1: Metals**

| | | CCME FAL | Tier 1 EQS | MMER | MDMER | SW-10 | | | | SW-11 | SW-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | | **30-Jun-15** | **29-Jul-16** | **24-Aug-15** | **24-Aug-15** | **Oct-5-2017** | **5-Oct-17** |
| **Metals** | **Units** | | | | | | | | SW-10 (DUP) | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | **5** | | | 39 | 28 | 220 | 210 | 420 | 430 |
| Total Antimony (Sb) | ug/L | | **20** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **5.0** | **1000** | **1000** | 130 | 36 | 380 | 370 | 1.4 | 1.9 |
| Total Barium (Ba) | ug/L | | **1000** | | | 5.4 | 7.3 | 7.1 | 6.9 | 3.9 | 3.5 |
| Total Beryllium (Be) | ug/L | | **5.3** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | **1200** | | | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | **0.04** | | | 0.061 | 0.10 | 0.011 | <0.010 | 0.022 | 0.021 |
| Total Calcium (Ca) | ug/L | | | | | 4900 | 6400 | 10000 | 10000 | 1100 | 830 |
| Total Chromium (Cr) | ug/L | | | | | <1.0 | <1.0 | <1.0 | <1.0 | 1.1 | <1.0 |
| Total Cobalt (Co) | ug/L | | **10** | | | 1.8 | 1.4 | 2.2 | 2.3 | <0.40 | 0.73 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **2** | **600** | **600** | 3.0 | 3.6 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | **300** | | | 1400 | 78 | 6000 | 5900 | 1200 | 1000 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **1** | **400** | **400** | <0.50 | <0.50 | 1.1 | 1.2 | 0.75 | 0.60 |
| Total Magnesium (Mg) | ug/L | | | | | 660 | 900 | 1200 | 1200 | 530 | 500 |
| Total Manganese (Mn) | ug/L | | **820** | | | 110 | 78 | 290 | 280 | 41 | 54 |
| Total Mercury (Hg) | ug/L | **0.026** | | | | <0.013 | <0.013 | 0.025 | 0.028 | - | - |
| Total Molybdenum (Mo) | ug/L | **73** | **73** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **25** | **1000** | **1000** | 7.2 | 8.7 | 6.2 | 6.1 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | | | 140 | 170 | 140 | 140 | <100 | <100 |
| Total Potassium (K) | ug/L | | | | | 640 | 790 | 1000 | 1000 | 180 | 160 |
| Total Selenium (Se) | ug/L | **1** | **1** | | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | **0.25** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | | | 1900 | 2100 | 2500 | 2400 | 2300 | 2400 |
| Total Strontium (Sr) | ug/L | | **21000** | | | 19 | 26 | 33 | 33 | 9.0 | 7.1 |
| Total Thallium (Tl) | ug/L | **0.8** | **0.8** | | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | | | <2.0 | <2.0 | 2.8 | 2.9 | 4.5 | 3.3 |
| Total Uranium (U) | ug/L | **15** | **300** | | | <0.10 | <0.10 | 0.21 | 0.20 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | **6** | | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **30** | **1000** | **1000** | 13 | 19 | <5.0 | <5.0 | 5.0 | <5.0 |

**Notes**

CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference)

Tier 1 EQS - Nova Scotia Environment Tier 1 Environmental Quality Standards for Freshwater Surface Water (provided for reference)

MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference)

MDMER - Federal Metal and Diamond Mining Effluent Regulations - guidelines shown represent maximum authorized concentration in a grab sample (provided for reference)

(1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table).

(2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet).

(3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table).

(4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table).

(5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table).

- denotes not analyzed

**TABLEG.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | (DUP) | | | (DUP) | | | (DUP) | | | (DUP) | |
| Acidity | mg/L | ns | 5.0 | 5.2 | <5.0 | 6.8 | 12 | <5.0 | 8.8 | 6.6 | 5.8 | 5.0 | 6.8 | 7.4 | 7.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.5 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | <20 | 32 | 62 | 48 | 32 | 23 | 26 | 31 | 49 | 43 | 39 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.6 | 3.8 | 2.7 | 5.5 | 5.0 | 3.3 | 2.9 | 3.0 | 4.3 | 5.8 | 5.6 | 5.8 |
| Colour | TCU | narrative [1] | 5.0 | 65 | 73 | 130 | 190 | 140 | 110 | 93 | 89 | 130 | 140 | 140 | 140 |
| Total Dissolved Solids | mg/L | ns | 10 | <10 | 19 | 30 | 45 | 52 | 34 | 29 | 25 | 24 | 43 | 22 | 23 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 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 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.064 | 0.052 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.0 | 6.9 | 13 | 20 | 15 | 12 | 7.5 | 7.4 | 9.6 | 18 | 16 | 16 |
| Orthophosphate (P) | mg/L | ns | 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 |
| pH | pH | 6.5 - 9.0 | N/A | 5.84 | 5.91 | 5.50 | 5.87 | 6.20 | 5.48 | 5.16 | 5.10 | 5.55 | 5.23 | 4.89 | 4.79 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | 0.022 | 0.023 | <0.020 | <0.020 | <0.020 | 0.023 | 0.021 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.8 | 1.6 | 3.6 | 2.7 | 2.7 | 1.8 | 1.8 | 1.1 | 3.7 | 4.1 | 4.0 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.0 | <1.0 | 2.0 | 2.4 | 2.8 | <1.0 | <1.0 | <1.0 | 6.8 | 3.8 | 1.6 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 3.5 | <2.0 | <2.0 | <2.0 | 2.5 | <2.0 | <2.0 | 3.1 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.61 | 0.56 | 1.6 | 1.8 | 2.3 | 1.8 | 0.84 | 1.0 | 3.1 | <0.0050 | 0.99 | 1.1 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 2.7 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 19 | 19 | 18 | 31 | 34 | 22 | 17 | 17 | 18 | 28 | 28 | 28 |
| **Calculated Parameters** | | | | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.100 | 0.110 | 0.0800 | 0.230 | 0.270 | 0.0900 | 0.0800 | 0.140 | 0.120 | 0.160 | 0.230 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 6.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 9.0 | 8.0 | 18 | 19 | 9.0 | 7.0 | 10 | 9.0 | 15 | 18 | 15 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.140 | 0.190 | 0.260 | 0.380 | 0.150 | 0.130 | 0.130 | 0.180 | 0.260 | 0.240 | 0.250 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.4 | 2.4 | 4.4 | 5.0 | 9.9 | 2.6 | 2.0 | 2.0 | 2.8 | 4.7 | 4.0 | 4.3 |
| Ion Balance (% Difference) | % | ns | N/A | 16.7 | 12.0 | 40.7 | 6.12 | 16.9 | 25.0 | 23.8 | 3.70 | 20.0 | 23.8 | 2.13 | 19.1 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | -3.97 | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | -4.22 | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.064 | 0.052 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | 10.2 | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | 10.4 | NC | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 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 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.669 | 0.514 | 1.37 | 0.293 | 1.48 | 0.55 | 0.64 | 0.591 | 2.29 | 3.68 | 0.231 | 0.294 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.704 | 0.539 | 1.52 | 0.282 | 1.7 | 0.468 | 0.627 | 0.6 | 3.27 | 7.34 | 0.426 | 0.506 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | | | | | |
| Temperature | °C | narrative [1] | | 3.2 | - | 17.6 | 15.6 | - | 0.2 | 6.8 | - | 21.4 | 13.2 | - | 3.3 |
| Pressure | mmHg | ns | | 741.3 | - | 744.9 | 751.6 | - | 747.4 | 740.9 | - | 752.5 | 743 | - | 739.6 |
| Dissolved Oxygen | % | ns | | 103.1 | - | 92.7 | 67.4 | - | 86.6 | 100.1 | - | 72 | 87.8 | - | 11.8 |
| Dissolved Oxygen | mg/L | narrative [3] | | 13.41 | - | 8.65 | 6.58 | - | 12.36 | 11.89 | - | 6.23 | 8.98 | - | 11.83 |
| Turbidity | NTU | narrative [2] | | 0.95 | - | 1.42 | 2.1 | - | 1.87 | 1.08 | - | 1.89 | 2.24 | - | 1.18 |
| Conductivity | uS/cm | ns | | 13 | - | 17.6 | 24.4 | - | 13.4 | 13.5 | - | 18.3 | 23.2 | - | 19.6 |
| Salinity | ppt | ns | | 0.01 | - | 0.01 | 0.01 | - | 0.01 | 0.01 | - | 0.01 | 0.01 | - | 0.01 |
| pH | pH | 6.5 - 9.0 | | 4.69 | - | 5.07 | 4.64 | - | 4.19 | 4.53 | - | 4.79 | 5.39 | - | 4.21 |
| Oxidation Reduction Potential | mV | ns | | 210.2 | - | 190.4 | 307.1 | - | 354.1 | 235.1 | - | 307.3 | 207.1 | - | 301.5 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:

- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 6.9 | 12 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 26 | 28 | 51 | 37 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.0 | 4.4 | 5.5 | 5.9 |
| Colour | TCU | narrative [1] | 5.0 | 100 | 120 | 180 | 150 |
| Total Dissolved Solids | mg/L | ns | 10 | 34 | 31 | 54 | 43 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.054 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | 0.052 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.1 | 9.6 | 17 | 16 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.60 | 6.82 | 7.14 | 6.26 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.020 | 0.029 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.7 | 1.3 | 3.7 | 4.1 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 15 | 6.0 | 40 | 12 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 4.3 | 3.1 | <0.0050 | 2.4 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 20 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 21 | 25 | 43 | 29 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.260 | 0.390 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 6.9 | 12 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 11 | 17 | 47 | 26 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.330 | 0.340 | 1.79 | 0.860 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 12 | 11 | 81 | 35 |
| Ion Balance (% Difference) | % | ns | N/A | 61.0 | 13.3 | 64.2 | 67.0 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -3.25 | -1.86 | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | -3.51 | -2.11 | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.054 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 10.1 | 9.00 | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.3 | 9.25 | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.561 | 2.21 | 3.94 | 0.264 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.602 | 3.16 | 6.65 | 0.48 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 6.9 | 20.8 | 13.2 | 3.3 |
| Pressure | mmHg | ns | | 741.2 | 752.7 | 743.3 | 739.7 |
| Dissolved Oxygen | % | ns | | 101.1 | 78 | 94 | 95.1 |
| Dissolved Oxygen | mg/L | narrative [3] | | 11.99 | 6.92 | 9.64 | 12.37 |
| Turbidity | NTU | narrative [2] | | 10.4 | 19.4 | 17.1 | 21.3 |
| Conductivity | uS/cm | ns | | 12.4 | 18.3 | 22.8 | 19.1 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 4.67 | 5.19 | 5.56 | 4.48 |
| Oxidation Reduction Potential | mV | ns | | 238.4 | 250.8 | 218 | 293.4 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW2A | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 2-Dec-19 |
| **Inorganics** | **Units** | | | | | | (DUP) | |
| Acidity | mg/L | ns | 5.0 | 5.0 | 7.0 | 11 | 9.0 | 8.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 44 | 60 | 37 | 35 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 4.0 | 2.7 | 4.9 | 3.4 | 3.4 |
| Colour | TCU | narrative [1] | 5.0 | 69 | 140 | 190 | 110 | 110 |
| Total Dissolved Solids | mg/L | ns | 10 | 23 | 33 | 54 | 37 | 35 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.067 | <0.050 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.3 | 16 | 20 | 12 | 11 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.97 | 5.77 | 5.71 | 5.63 | 5.28 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.7 | 3.4 | 2.7 | 2.8 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 12 | 2.6 | <1.0 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | 3.6 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.61 | 4.3 | 2.2 | 1.0 | 0.93 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 20 | 18 | 29 | 22 | 22 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.120 | 0.0800 | 0.210 | 0.100 | 0.0900 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 8.0 | 17 | 9.0 | 9.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.150 | 0.260 | 0.150 | 0.140 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.4 | 2.3 | 4.6 | 2.5 | 2.4 |
| Ion Balance (% Difference) | % | ns | N/A | 7.69 | 30.4 | 10.6 | 20.0 | 21.7 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.067 | <0.050 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 1.13 | 5.32 | 1.56 | 1.48 | 0.291 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 1.16 | 6.28 | 1.63 | 1.7 | 0.507 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | |
| Temperature | °C | narrative [1] | | 3.9 | 18 | 15.8 | - | 0.3 |
| Pressure | mmHg | ns | | 740.5 | 746.6 | 752 | - | 746.4 |
| Dissolved Oxygen | % | ns | | 101.6 | 93 | 77.2 | - | 83 |
| Dissolved Oxygen | mg/L | narrative [3] | | 13.03 | 8.67 | 7.61 | - | 11.85 |
| Turbidity | NTU | narrative [2] | | 1.48 | 5.06 | 1.78 | - | 0.88 |
| Conductivity | uS/cm | ns | | 13.5 | 18 | 24.7 | - | 14.7 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | - | 0.01 |
| pH | pH | 6.5 - 9.0 | | 4.9 | 4.98 | 4.56 | - | 4.18 |
| Oxidation Reduction Potential | mV | ns | | 211.5 | 201.7 | 281.5 | - | 279 |

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW4A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | | | | |
| Acidity | mg/L | ns | 5.0 | 5.6 | 8.4 | 15 | 11 | <5.0 | 5.6 | 14 | 7.8 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 32 | 53 | 28 | 23 | 33 | 53 | 30 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.8 | 2.9 | 5.8 | 3.9 | 3.0 | 5.0 | 5.1 | 6.0 |
| Colour | TCU | narrative [1] | 5.0 | 58 | 150 | 180 | 89 | 85 | 150 | 170 | 130 |
| Total Dissolved Solids | mg/L | ns | 10 | 17 | 31 | 57 | 36 | 41 | 27 | 52 | 24 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.072 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.078 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.5 | 14 | 20 | 11 | 7.0 | 11 | 22 | 13 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.70 | 5.74 | 5.54 | 6.12 | 5.25 | 5.73 | 5.14 | 5.15 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | 0.022 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.1 | 1.7 | 2.8 | 2.8 | 2.0 | 1.7 | 3.8 | 4.3 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 2.0 | 3.0 | 5.2 | 1.0 | 1.2 | 9.6 | 1.2 | 1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | 4.7 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.82 | 1.9 | 5.1 | 0.68 | 0.82 | 1.6 | <0.0050 | 0.53 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 1.8 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 19 | 18 | 33 | 25 | 16 | 22 | 30 | 29 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0800 | 0.260 | 0.110 | 0.0900 | 0.140 | 0.140 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 8.0 | 20 | 10 | 8.0 | 11 | 14 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.160 | 0.310 | 0.150 | 0.140 | 0.210 | 0.250 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.5 | 2.7 | 6.1 | 2.8 | 2.3 | 3.1 | 4.6 | 4.3 |
| Ion Balance (% Difference) | % | ns | N/A | 15.4 | 33.3 | 8.77 | 15.4 | 21.7 | 20.0 | 28.2 | 17.1 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.072 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 1.46 | 1.41 | 1.59 | 1.02 | 0.574 | 0.877 | 3.92 | 0.239 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 1.38 | 1.59 | 1.79 | 1.26 | 0.634 | 1.41 | 5.04 | 0.376 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | |
| Temperature | °C | narrative [1] | | 4.3 | 16.3 | 15.1 | 1.4 | 10.4 | 20.8 | 13.7 | 3.1 |
| Pressure | mmHg | ns | | 740.7 | 746 | 751.7 | 745.4 | 740.8 | 751.4 | 743.7 | 739.1 |
| Dissolved Oxygen | % | ns | | 80.7 | 68.2 | 48.8 | 43.2 | 85.4 | 22.7 | 55.2 | 67.3 |
| Dissolved Oxygen | mg/L | narrative [3] | | 10.24 | 6.57 | 4.83 | 5.94 | 9.26 | 2.03 | 5.59 | 8.78 |
| Turbidity | NTU | narrative [2] | | 1.07 | 1.47 | 4.5 | 1.21 | 1.19 | 1.46 | 1.9 | 1.41 |
| Conductivity | uS/cm | ns | | 13.5 | 17.2 | 27.3 | 16.7 | 14.6 | 23.4 | 27.9 | 19 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 5.06 | 5.24 | 4.81 | 4.42 | 4.83 | 4.25 | 5.23 | 4.55 |
| Oxidation Reduction Potential | mV | ns | | 200.1 | 204.1 | 236 | 325.2 | 237.1 | 235.3 | 247.7 | 266 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW5 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | (DUP) | | | | | | |
| Acidity | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | 42 | 5.2 | <5.0 | 5.0 | <5.0 | <5.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | 6.2 | 8.7 | 8.3 | 30 | 6.0 | <5.0 | 8.9 | 9.2 | 7.1 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | <20 | <20 | 25 | <20 | <20 | <20 | <20 | <20 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.2 | 2.8 | 2.6 | 3.4 | 3.6 | 2.8 | 4.0 | 4.1 | 4.9 |
| Colour | TCU | narrative [1] | 5.0 | 17 | 18 | 17 | 68 | 23 | 22 | 30 | 27 | 26 |
| Total Dissolved Solids | mg/L | ns | 10 | 17 | 20 | 28 | 67 | 25 | 33 | 30 | 40 | 25 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.063 | <0.050 | <0.050 | <0.050 | 0.053 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.12 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 2.9 | 4.2 | 4.5 | 5.9 | 3.9 | 2.8 | 3.7 | 4.8 | 4.2 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | 0.036 | <0.010 | <0.010 | <0.010 | 0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.48 | 6.65 | 6.61 | 6.52 | 6.67 | 6.38 | 6.65 | 6.76 | 6.79 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | 0.061 | <0.020 | <0.020 | 0.024 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.7 | 1.2 | 1.2 | 7.6 | 2.9 | 1.6 | 0.63 | 2.0 | 3.3 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.2 | 3.0 | 3.4 | 23 | 2.4 | 1.6 | 6.8 | 5.8 | 2.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.9 | 2.8 | 3.2 | 12.0 | 6.6 | 5.0 | 4.0 | 4.0 | 7.1 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.81 | 1.4 | 1.3 | 10 | 1.5 | 0.74 | 1.9 | <0.0050 | 1.0 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 1.5 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 25 | 33 | 32 | 95 | 35 | 25 | 33 | 36 | 43 |
| **Calculated Parameters** | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.280 | 0.310 | 0.310 | 0.950 | 0.360 | 0.180 | 0.370 | 0.380 | 0.430 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | 6.2 | 8.6 | 8.3 | 30 | 6.0 | <1.0 | 8.9 | 9.2 | 7.0 |
| Calculated TDS | mg/L | ns | 1.0 | 16 | 19 | 19 | 65 | 23 | 15 | 22 | 23 | 28 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.230 | 0.330 | 0.320 | 1.12 | 0.300 | 0.250 | 0.370 | 0.350 | 0.410 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 6.6 | 11 | 11 | 38 | 9.7 | 7.5 | 11 | 10 | 13 |
| Ion Balance (% Difference) | % | ns | N/A | 9.80 | 3.13 | 1.59 | 8.21 | 9.09 | 16.3 | 0.00 | 4.11 | 2.38 |
| Langelier Index (@ 20C) | N/A | ns | | -3.70 | -3.17 | -3.24 | -2.22 | -3.36 | NC | -3.17 | -3.10 | -3.05 |
| Langelier Index (@ 4C) | N/A | ns | | -3.95 | -3.42 | -3.49 | -2.47 | -3.61 | NC | -3.43 | -3.36 | -3.30 |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.063 | <0.050 | <0.050 | <0.050 | 0.053 |
| Saturation pH (@ 20C) | N/A | ns | | 10.2 | 9.82 | 9.85 | 8.74 | 10.0 | NC | 9.82 | 9.86 | 9.84 |
| Saturation pH (@ 4C) | N/A | ns | | 10.4 | 10.1 | 10.1 | 8.99 | 10.3 | NC | 10.1 | 10.1 | 10.1 |
| **Radionuclide** | | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 1.16 | 2.55 | 2.55 | 0.015 | 0.858 | 0.781 | 2.35 | 0.489 | 1.51 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 1.12 | 1.94 | 2.31 | 0.01 | 1.04 | 0.773 | 4.34 | 1.76 | 1.95 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | | |
| Temperature | °C | narrative [1] | | 4.7 | 18.4 | - | 10.5 | 0.9 | 8.8 | 20.9 | 15.2 | 3 |
| Pressure | mmHg | ns | | 740.7 | 745.3 | - | 751.3 | 731.8 | 740.7 | 753.7 | 743.4 | 738.6 |
| Dissolved Oxygen | % | ns | | 100.2 | 83.6 | - | 5.7 | 92.6 | 93.9 | 91.4 | 81.9 | 95.1 |
| Dissolved Oxygen | mg/L | narrative [3] | | 12.56 | 7.7 | - | 0.63 | 12.73 | 10.64 | 8.23 | 8.06 | 12.46 |
| Turbidity | NTU | narrative [2] | | 1.26 | 1.1 | - | 0.92 | 20.9 | 0.97 | 2.47 | 1.15 | 1.15 |
| Conductivity | uS/cm | ns | | 16.6 | 32.4 | - | 78 | 0.02 | 20.3 | 36.2 | 27 | 27.4 |
| Salinity | ppt | ns | | 0.01 | 0.02 | - | 0.05 | 2.31 | 0.01 | 0.02 | 0.01 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 6.27 | 6.44 | - | 5.98 | 6.11 | 5.97 | 6.59 | 6.65 | 6.28 |
| Oxidation Reduction Potential | mV | ns | | 132.4 | 102.4 | - | 73.4 | 229.6 | 167.6 | 243 | 123 | 193.4 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1. General Chemistry**

| | | CCME FWAL | RDL | SW5A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | 5.4 | 5.4 | 6.8 | 6.4 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 23 | 28 | 49 | 35 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 4.4 | 5.0 | 5.5 |
| Colour | TCU | narrative [1] | 5.0 | 93 | 130 | 150 | 120 |
| Total Dissolved Solids | mg/L | ns | 10 | 36 | 26 | 54 | 56 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.057 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.5 | 10 | 18 | 12 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.30 | 5.68 | 5.19 | 5.18 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.021 | 0.021 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.2 | 3.9 | 4.4 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.0 | 4.0 | 1.8 | 1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.5 | <2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 1.0 | 2.5 | <0.0050 | 0.98 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 1.8 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 16 | 18 | 29 | 29 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.140 | 0.120 | 0.140 | 0.160 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 9.0 | 14 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.170 | 0.260 | 0.260 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.3 | 2.5 | 4.7 | 5.5 |
| Ion Balance (% Difference) | % | ns | N/A | 0.00 | 17.2 | 30.0 | 23.8 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.057 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.627 | 2 | 1.26 | 0.326 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.588 | 3.27 | 4.15 | 0.496 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 7.4 | 19.6 | 14.3 | 3.3 |
| Pressure | mmHg | ns | | 740.8 | 753.6 | 743.6 | 738.8 |
| Dissolved Oxygen | % | ns | | 84.9 | 46.7 | 65.9 | 83.6 |
| Dissolved Oxygen | mg/L | narrative [3] | | 9.85 | 4.26 | 6.61 | 10.85 |
| Turbidity | NTU | narrative [2] | | 0.87 | 2.05 | 1.56 | 0.93 |
| Conductivity | uS/cm | ns | | 13.7 | 17.8 | 24.1 | 18.8 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 4.82 | 5.1 | 5.56 | 4.95 |
| Oxidation Reduction Potential | mV | ns | | 218.2 | 290 | 199.9 | 239.8 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW6A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | | | | |
| Acidity | mg/L | ns | 5.0 | <5.0 | 6.6 | 8.6 | 7.8 | 8.8 | 8.8 | 8.6 | 6.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 25 | 41 | 30 | 21 | 31 | 51 | 30 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.7 | 2.9 | 4.6 | 3.8 | 2.5 | 4.4 | 5.2 | 6.3 |
| Colour | TCU | narrative [1] | 5.0 | 57 | 110 | 130 | 91 | 78 | 120 | 110 | 120 |
| Total Dissolved Solids | mg/L | ns | 10 | 14 | 17 | 39 | 35 | 24 | 24 | 46 | 28 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.12 | 0.066 | <0.050 | <0.050 | 0.071 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.063 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 5.8 | 11 | 13 | 11 | 7.0 | 9.4 | 16 | 13 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.1 | 5.73 | 5.44 | 5.14 | 5.97 | 5.59 | 5.46 | 5.13 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.030 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.0 | 1.7 | 2.0 | 2.8 | 1.8 | 1.5 | 2.1 | 4.4 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 1.2 | 1.2 | 1.0 | <1.0 | 7.2 | <1.0 | 3.2 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | 5.4 | <2.0 | <2.0 | <2.0 | <2.0 | 3.3 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.30 | 0.89 | 1.2 | 0.43 | 0.51 | 2.7 | <0.0050 | 0.71 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 1.0 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 19 | 18 | 24 | 22 | 16 | 19 | 30 | 29 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0800 | 0.240 | 0.120 | 0.0800 | 0.120 | 0.150 | 0.250 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 8.0 | 17 | 11 | 7.0 | 11 | 13 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.160 | 0.240 | 0.170 | 0.130 | 0.220 | 0.270 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.5 | 2.8 | 4.0 | 3.2 | 2.1 | 2.8 | 5.3 | 4.4 |
| Ion Balance (% Difference) | % | ns | N/A | 12.0 | 33.3 | 0.00 | 17.2 | 23.8 | 29.4 | 28.6 | 2.04 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.12 | 0.066 | <0.050 | <0.050 | 0.071 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.363 | 1.18 | 1.03 | 0.439 | 0.595 | 0.697 | 0.794 | 0.525 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.38 | 1.2 | 1.14 | 0.569 | 0.765 | 1.1 | 2.27 | 0.725 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | |
| Temperature | °C | narrative [1] | | 2.7 | 14.1 | 14.8 | 0.3 | 6.4 | 18.7 | 17.4 | 0.3 |
| Pressure | mmHg | ns | | 740.3 | 746 | 750.6 | 745.9 | 734.2 | 751.3 | --- | 753.2 |
| Dissolved Oxygen | % | ns | | 102 | 90.7 | 61.8 | 84.3 | 84 | 45.8 | --- | 88.5 |
| Dissolved Oxygen | mg/L | narrative [3] | | 13.46 | 9.12 | 6.2 | 12 | 9.98 | 4.18 | --- | 12.69 |
| Turbidity | NTU | narrative [2] | | 0.45 | 0.59 | 1.27 | 0.78 | 0.64 | 1.32 | 1.15 | 0.67 |
| Conductivity | uS/cm | ns | | 11.7 | 16 | 11.3 | 14.2 | 12.7 | 17.9 | 34 | 17.3 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 5.26 | 5.18 | 4.92 | 4.47 | 4.59 | 4.35 | 4.14 | 4.39 |
| Oxidation Reduction Potential | mV | ns | | 161 | 212.8 | 268 | 354 | 272.1 | 283.2 | --- | 311.9 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW9 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | <5.0 | 5.4 | <5.0 | 8.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | 7.6 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 34 | 43 | 37 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 5.6 | 5.1 | 6.0 | 4.7 |
| Colour | TCU | narrative [1] | 5.0 | 67 | 120 | 140 | 110 |
| Total Dissolved Solids | mg/L | ns | 10 | 29 | 41 | 53 | 39 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.053 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.3 | 13 | 15 | 12 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.48 | 6.49 | 6.57 | 5.75 |
| Total Phosphorus | mg/L | ns | 0.020 | 0.020 | <0.020 | 0.023 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.8 | 2.6 | 2.3 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.6 | 1.6 | 2.6 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | 3.9 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.99 | 0.95 | 3.1 | 1.3 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 29 | 29 | 35 | 24 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.160 | 0.140 | 0.400 | 0.140 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | 7.6 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 13 | 13 | 25 | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.250 | 0.280 | 0.400 | 0.210 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 4.9 | 6.2 | 10 | 4.2 |
| Ion Balance (% Difference) | % | ns | N/A | 22.0 | 33.3 | 0.00 | 20.0 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | -3.51 | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | -3.76 | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.053 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | 10.1 | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | 10.3 | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 1.06 | 1.32 | 1.54 | 0.463 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 1.04 | 1.3 | 1.61 | 0.593 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 2.8 | 16.9 | 16.5 | 0.6 |
| Pressure | mmHg | ns | | 745.9 | 747.7 | 754 | 751.4 |
| Dissolved Oxygen | % | ns | | 104.7 | 99.2 | 83.9 | 90.2 |
| Dissolved Oxygen | mg/L | narrative [3] | | 13.92 | 9.45 | 8.11 | 12.82 |
| Turbidity | NTU | narrative [2] | | 0.97 | 1.08 | 2.96 | 1.34 |
| Conductivity | uS/cm | ns | | 17.6 | 25.7 | 29.3 | 14.9 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.02 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 6.07 | 5.98 | 5.92 | 4.69 |
| Oxidation Reduction Potential | mV | ns | | 115.6 | 164.3 | 204.9 | 145.6 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW10 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | 11 | 17 | <5.0 | 13 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | 10 | 12 | 10 | 7.7 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | <20 | 22 | <20 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.8 | 2.7 | 2.7 | 3.7 |
| Colour | TCU | narrative [1] | 5.0 | 16 | 38 | 28 | 28 |
| Total Dissolved Solids | mg/L | ns | 10 | 31 | 36 | 26 | 44 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.066 | <0.050 | <0.050 | 0.069 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 2.3 | 4.5 | 5.0 | 4.2 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | 0.012 | 0.011 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.65 | 6.30 | 6.84 | 6.17 |
| Total Phosphorus | mg/L | ns | 0.020 | 0.034 | <0.020 | 0.026 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 4.2 | 4.6 | 1.5 | 4.4 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.2 | 2.6 | 5.6 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 8.5 | 8.6 | 6.0 | 10 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 4.0 | 4.1 | 0.50 | 4.6 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 51 | 50 | 35 | 47 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.490 | 0.500 | 0.410 | 0.480 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | 10 | 12 | 10 | 7.7 |
| Calculated TDS | mg/L | ns | 1.0 | 33 | 34 | 24 | 33 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.480 | 0.490 | 0.360 | 0.460 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 17 | 17 | 11 | 15 |
| Ion Balance (% Difference) | % | ns | N/A | 1.03 | 1.01 | 6.49 | 2.13 |
| Langelier Index (@ 20C) | N/A | ns | | -2.91 | -3.17 | -2.91 | -3.57 |
| Langelier Index (@ 4C) | N/A | ns | | -3.16 | -3.42 | -3.16 | -3.82 |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.066 | <0.050 | <0.050 | 0.069 |
| Saturation pH (@ 20C) | N/A | ns | | 9.56 | 9.47 | 9.75 | 9.74 |
| Saturation pH (@ 4C) | N/A | ns | | 9.81 | 9.72 | 10.0 | 9.99 |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.237 | 2.36 | 0.129 | 0.234 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.273 | 2.23 | 0.089 | 0.227 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 2.9 | 8.4 | 16.1 | 4.6 |
| Pressure | mmHg | ns | | 740.3 | 744.9 | 751.6 | 746.6 |
| Dissolved Oxygen | % | ns | | 47.5 | 47.3 | 58.8 | 38.6 |
| Dissolved Oxygen | mg/L | narrative [3] | | 6.25 | 5.43 | 5.72 | 4.9 |
| Turbidity | NTU | narrative [2] | | 0.37 | 1.88 | 1.94 | 0.42 |
| Conductivity | uS/cm | ns | | 20.4 | 38.9 | 29.8 | 37.3 |
| Salinity | ppt | ns | | 0.02 | 0.03 | 0.02 | 0.03 |
| pH | pH | 6.5 - 9.0 | | 6.01 | 5.92 | 6.32 | 5.72 |
| Oxidation Reduction Potential | mV | ns | | 107.9 | 45.4 | 103.9 | 165.9 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW11 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | | | | (DUP) | | | (DUP) | |
| Acidity | mg/L | ns | 5.0 | 9.0 | 11 | 21 | 14 | 9.4 | 9.6 | 6.8 | 21 | 6.2 | 7.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 41 | 72 | 51 | 30 | 33 | 46 | 82 | 57 | 49 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 4.0 | 2.4 | 5.6 | 3.7 | 2.7 | 3.0 | 5.5 | 7.2 | 6.8 | 6.8 |
| Colour | TCU | narrative [1] | 5.0 | 45.0 | 180 | 240 | 130 | 120 | 120 | 210 | 220 | 170 | 170 |
| Total Dissolved Solids | mg/L | ns | 10 | 13 | 32 | 57 | 46 | 46 | 35 | 27 | 66 | 38 | 66 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.052 | <0.050 | <0.050 | <0.050 | <0.050 | 0.057 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.4 | 19 | 23 | 18.0 | 9.8 | 10 | 16 | 32 | 18 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.68 | 4.94 | 4.95 | 5.71 | 5.14 | 5.30 | 6.16 | 4.78 | 5.78 | 5.46 |
| Total Phosphorus | mg/L | ns | 0.020 | 0.040 | <0.020 | 0.027 | <0.020 | <0.020 | <0.020 | <0.020 | 0.023 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.6 | 1.5 | 3.2 | 2.4 | 1.7 | 1.6 | 1.3 | 1.9 | 4.0 | 3.9 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 2.2 | 1.2 | 2.6 | 20 | 1.0 | 1.0 | 1.6 | 6.4 | <1.0 | 1.6 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.62 | 0.57 | 1.5 | 4.8 | 0.89 | 1.1 | 0.56 | <0.0050 | 1.3 | 1.4 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 0.84 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 23 | 20 | 35 | 24 | 16 | 17 | 20 | 42 | 31 | 32 |
| **Calculated Parameters** | | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0700 | 0.160 | 0.110 | 0.0800 | 0.0900 | 0.150 | 0.200 | 0.200 | 0.190 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 7.0 | 15 | 11 | 7.0 | 8.0 | 11 | 16 | 17 | 17 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.160 | 0.150 | 0.320 | 0.200 | 0.140 | 0.150 | 0.190 | 0.360 | 0.320 | 0.320 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.9 | 2.3 | 5.8 | 3.7 | 2.6 | 2.8 | 4.2 | 7.7 | 8.4 | 8.3 |
| Ion Balance (% Difference) | % | ns | N/A | 18.5 | 36.4 | 33.3 | 29.0 | 27.3 | 25.0 | 11.8 | 28.6 | 23.1 | 25.5 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.052 | <0.050 | <0.050 | <0.050 | <0.050 | 0.057 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 3.29 | 1.62 | 2.98 | 0.468 | 0.68 | 0.614 | 3.96 | 8.06 | 0.105 | 0.109 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 3.14 | 1.7 | 3.2 | 0.542 | 0.719 | 0.677 | 5.98 | 20.9 | 0.18 | 0.291 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | | | |
| Temperature | °C | narrative [1] | | 0.9 | 17 | 15.1 | 3.3 | 5.2 | - | 19.8 | 17.5 | - | 3.8 |
| Pressure | mmHg | ns | | 739.6 | 742.6 | 748.6 | 745.6 | 733.4 | - | 754.1 | --- | - | 736.5 |
| Dissolved Oxygen | % | ns | | 65.2 | 88 | 30.3 | 37.4 | 70.1 | - | 3.7 | 42.7 | - | 62.1 |
| Dissolved Oxygen | mg/L | narrative [3] | | 8.94 | 8.32 | 2.99 | 4.89 | 8.64 | - | 0.33 | 4.94 | - | 7.92 |
| Turbidity | NTU | narrative [2] | | 0.74 | 0.68 | 1.46 | 1.66 | 1.46 | - | 0.89 | 3.49 | - | 1.22 |
| Conductivity | uS/cm | ns | | 15.2 | 19.3 | 28.7 | 26 | 12.9 | - | 20.7 | 51 | - | 20.8 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | - | 0.01 | 0.02 | - | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.71 | 4.92 | 4.5 | 5.09 | 4.8 | - | 4.04 | 4.43 | - | 5.03 |
| Oxidation Reduction Potential | mV | ns | | 164.6 | 177.9 | 275.2 | 85.7 | 265.4 | - | 217.5 | --- | - | 266.7 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW12 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | | | | | | |
| Acidity | mg/L | ns | 5.0 | 7.4 | 11 | 22 | 12 | 9.0 | 9.2 | 19 | 12 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | 44 | 74 | 42 | <20 | 50 | 88 | 51 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 4.0 | 2.6 | 5.3 | 3.7 | 2.5 | 4.9 | 8.2 | 7.6 |
| Colour | TCU | narrative [1] | 5.0 | 72 | 180 | 150 | 130 | 64 | 160 | 200 | 150 |
| Total Dissolved Solids | mg/L | ns | 10 | 18 | 29 | 62 | 47 | 26 | 27 | 74 | 53 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.13 | 0.062 | <0.050 | <0.050 | 0.056 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.055 | <0.050 | 0.12 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.8 | 17 | 29 | 16 | 6.7 | 20 (1) | 34 (1) | 20 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.013 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.75 | 5.25 | 4.58 | 5.35 | 5.51 | 4.88 | 4.34 | 4.47 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.2 | 1.5 | 3.7 | 2.5 | 2.2 | 1.0 | 3.2 | 3.7 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 4.8 | <1.0 | 2.2 | 1.0 | 2.4 | 66 | 1.4 | 1.8 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.91 | 0.77 | 2.3 | 1.6 | 0.58 | 26 | <0.0050 | 0.59 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 | 2.4 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 21 | 20 | 48 | 28 | 17 | 24 | 54 | 37 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0700 | 0.150 | 0.110 | 0.0800 | 0.140 | 0.230 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 7.0 | 15 | 11 | 8.0 | 10 | 18 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.140 | 0.310 | 0.180 | 0.120 | 0.200 | 0.370 | 0.260 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.5 | 1.9 | 5.1 | 2.3 | 2.0 | 2.2 | 6.4 | 3.6 |
| Ion Balance (% Difference) | % | ns | N/A | 15.4 | 33.3 | 34.8 | 24.1 | 20.0 | 17.7 | 23.3 | 8.33 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.13 | 0.062 | <0.050 | <0.050 | 0.056 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 5.76 | 2.52 | 1.69 | 0.756 | 0.413 | 40.4 | 0.342 | 0.112 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 5.92 | 2.55 | 1.68 | 0.759 | 0.45 | 75.7 | 1.01 | 0.285 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | | | |
| Temperature | °C | narrative [1] | | 0.5 | 13 | 12.9 | 0.7 | 4.7 | 23.7 | 13.7 | 3.5 |
| Pressure | mmHg | ns | | 739.1 | 744.8 | 748.9 | 745.7 | 732.9 | 754.3 | 741.8 | 737.2 |
| Dissolved Oxygen | % | ns | | 99.5 | 89.9 | 26.5 | 66.8 | 65.3 | 48 | 78.3 | 70.8 |
| Dissolved Oxygen | mg/L | narrative [3] | | 13.94 | 9.25 | 2.75 | 9.39 | 8.08 | 4.03 | 7.92 | 9.11 |
| Turbidity | NTU | narrative [2] | | 0.85 | 3.16 | 0.68 | 0.92 | 1.86 | 1.19 | 1.06 | 0.93 |
| Conductivity | uS/cm | ns | | 14.9 | 17.6 | 32.4 | 19.3 | 18.4 | 24.1 | 47.4 | 25.4 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.03 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.66 | 4.98 | 4.28 | 4.15 | 4.34 | 4.37 | 4.75 | 4.12 |
| Oxidation Reduction Potential | mV | ns | | 202.1 | 225.8 | 271.8 | 383.8 | 268.3 | 227.8 | 308 | 292.1 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

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me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW14 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | **(DUP)** | |
| Acidity | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 9.5 | 7.4 | 7.9 | 9.3 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | <20 | <20 | <20 | <20 | <20 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.8 | 2.7 | 4.5 | 8.9 | 5.6 |
| Colour | TCU | narrative [1] | 5.0 | 19 | 33 | 18 | 14 | 25 |
| Total Dissolved Solids | mg/L | ns | 10 | 48 | 28 | 30 | 29 | 67 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | 0.032 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 3.0 | 4.4 | 4.2 | 4.1 | 4.1 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.43 | 6.78 | 6.51 | 6.63 | 6.64 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.6 | 0.56 | 0.83 | 0.79 | 3.1 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 4.6 | 3.8 | 1.0 | 1.0 | 1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 5.6 | 3.9 | 4.4 | 4.4 | 5.5 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 1.4 | 1.5 | <0.0050 | <0.0050 | 1.0 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 0.89 | 0.98 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 24 | 34 | 34 | 34 | 43 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.190 | 0.350 | 0.360 | 0.500 | 0.460 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 9.5 | 7.4 | 7.9 | 9.3 |
| Calculated TDS | mg/L | ns | 1.0 | 15 | 21 | 20 | 25 | 28 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.240 | 0.360 | 0.300 | 0.310 | 0.420 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 7.3 | 11 | 7.9 | 8.2 | 13 |
| Ion Balance (% Difference) | % | ns | N/A | 11.6 | 1.41 | 9.09 | 23.5 | 4.55 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -3.01 | -3.57 | -3.41 | -3.11 |
| Langelier Index (@ 4C) | N/A | ns | | NC | -3.27 | -3.83 | -3.66 | -3.36 |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 9.80 | 10.1 | 10.0 | 9.74 |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.0 | 10.3 | 10.3 | 9.99 |
| **Radionuclide** | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 1.7 | 1.37 | 0.896 | 0.979 | 2.14 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 1.65 | 1.87 | 2.48 | 2.73 | 2.77 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | |
| Temperature | °C | narrative [1] | | 7.9 | 21.6 | 14.3 | - | 3 |
| Pressure | mmHg | ns | | 740.6 | 752.9 | 743.3 | - | 738.6 |
| Dissolved Oxygen | % | ns | | 59.7 | 63.4 | 57.6 | - | 78.7 |
| Dissolved Oxygen | mg/L | narrative [3] | | 6.88 | 5.33 | 5.75 | - | 10.29 |
| Turbidity | NTU | narrative [2] | | 1.69 | 2.43 | 0.75 | - | 4.46 |
| Conductivity | uS/cm | ns | | 25.8 | 33.2 | 31.3 | - | 27.5 |
| Salinity | ppt | ns | | 0.02 | 0.02 | 0.02 | - | 0.02 |
| pH | pH | 6.5 - 9.0 | | 5.94 | 5.85 | 6.58 | - | 6.27 |
| Oxidation Reduction Potential | mV | ns | | 120.2 | 232.4 | 130.8 | - | 254.6 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW19 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 21-22-Apr-20 | 17-18-Jun-20 | 17-18-Jun-20 | 24-25-Sep-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | (DUP) | | (DUP) | |
| Acidity | mg/L | ns | 5.0 | 6.6 | 7.6 | 5.6 | 13 | 13 | 7.8 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 26 | 38 | 31 | 72 | 70 | 47 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.3 | 3.8 | 3.7 | 5.8 | 5.8 | 5.7 |
| Colour | TCU | narrative [1] | 5.0 | 100 | 160 | 170 | 200 | 190 | 160 |
| Total Dissolved Solids | mg/L | ns | 10 | 27 | <10 | 23 | 62 | 45 | 31 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.093 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.1 | 11 | 11 | 27 | 27 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.17 | 5.40 | 5.11 | 4.60 | 4.97 | 4.85 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | 0.029 | 0.021 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.7 | 1.0 | 1.5 | 4.0 | 4.0 | 4.1 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 2.0 | 1.2 | 2.2 | 1.4 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.6 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.64 | 0.86 | 1.6 | <0.0050 | <0.0050 | 0.65 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | 1.7 | 2.5 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 18 | 19 | 37 | 37 | 30 |
| **Calculated Parameters** | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0600 | 0.110 | 0.100 | 0.160 | 0.160 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 6.0 | 8.0 | 8.0 | 16 | 16 | 17 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.120 | 0.140 | 0.150 | 0.300 | 0.280 | 0.220 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.6 | 2.0 | 2.0 | 5.1 | 5.1 | 3.5 |
| Ion Balance (% Difference) | % | ns | N/A | 33.3 | 12.0 | 20.0 | 30.4 | 27.3 | 0.00 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.558 | 0.822 | 0.794 | 1.63 | 1.33 | 0.204 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.546 | 1.3 | 1.27 | 5.1 | 4.47 | 0.346 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | | |
| Temperature | °C | narrative [1] | | 7.1 | 20.5 | - | 14.1 | - | 0 |
| Pressure | mmHg | ns | | 734.7 | 756.8 | - | 743.5 | - | 758.8 |
| Dissolved Oxygen | % | ns | | 94 | 67.6 | - | 88.1 | - | 93.4 |
| Dissolved Oxygen | mg/L | narrative [3] | | 11 | 6.02 | - | 8.86 | - | 13.51 |
| Turbidity | NTU | narrative [2] | | 0.71 | 0.8 | - | 0.93 | - | 0.76 |
| Conductivity | uS/cm | ns | | 13.9 | 18.1 | - | 32.5 | - | 18.8 |
| Salinity | ppt | ns | | 0.01 | 0.01 | - | 0.02 | - | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.42 | 3.98 | - | 4.88 | - | 4.04 |
| Oxidation Reduction Potential | mV | ns | | 289.9 | 357.2 | - | 310 | - | 307.4 |

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**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW26 | | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | |
| Acidity | mg/L | ns | 5.0 | 6.6 | 5.0 | 9.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 26 | 45 | 25 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 3.2 | 5.4 |
| Colour | TCU | narrative [1] | 5.0 | 90 | 130 | 87 |
| Total Dissolved Solids | mg/L | ns | 10 | 27 | 19 | 23 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | 0.055 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.7 | 14 (1) | 11 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.10 | 5.55 | 5.19 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.045 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.2 | 4.5 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 49 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.2 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.87 | 20 | 0.98 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 19 | 27 |
| **Calculated Parameters** | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.130 | 0.0900 | 0.160 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 8.0 | 15 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.130 | 0.180 | 0.230 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.9 | 2.6 | 4.3 |
| Ion Balance (% Difference) | % | ns | N/A | 0.00 | 33.3 | 18.0 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | 0.055 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC |
| **Radionuclide** | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.687 | 0.914 | 0.124 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.63 | 1.52 | 0.245 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | |
| Temperature | °C | narrative [1] | | 9.2 | 22.1 | 3.8 |
| Pressure | mmHg | ns | | 741 | 753.4 | 739.1 |
| Dissolved Oxygen | % | ns | | 86.6 | 39.1 | 70.6 |
| Dissolved Oxygen | mg/L | narrative [3] | | 9.74 | 3.55 | 9.07 |
| Turbidity | NTU | narrative [2] | | 0.89 | 41.5 | 0.95 |
| Conductivity | uS/cm | ns | | 14.7 | 22.6 | 18.7 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 4.8 | 4.91 | 4.47 |
| Oxidation Reduction Potential | mV | ns | | 236.1 | 270.3 | 254.6 |

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**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | 26A |
|---|---|---|---|---|
| **Sampling Date** | | | | **24-25-Sep-20** |
| **Inorganics** | **Units** | | | |
| Acidity | mg/L | ns | 5.0 | 7.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 56 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 5.2 |
| Colour | TCU | narrative [1] | 5.0 | 170 |
| Total Dissolved Solids | mg/L | ns | 10 | 39 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 21 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.02 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 4.1 |
| Total Suspended Solids | mg/L | narrative[2] | 1.0 | 2.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0030 |
| Turbidity | NTU | narrative [3] | 0.10 | <0.0050 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | 1.6 |
| Conductivity | uS/cm | ns | 1.0 | 30 |
| **Calculated Parameters** | | | | |
| Anion Sum | me/L | ns | N/A | 0.150 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 15 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.260 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 4.6 |
| Ion Balance (% Difference) | % | ns | N/A | 26.8 |
| Langelier Index (@ 20C) | N/A | ns | | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC |
| **Radionuclide** | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 6.69 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 6.22 |
| **Field Parameters** | **Units** | **CCME FWAL** | | |
| Temperature | °C | narrative[1] | | 14 |
| Pressure | mmHg | ns | | 743.8 |
| Dissolved Oxygen | % | ns | | 68.6 |
| Dissolved Oxygen | mg/L | narrative[3] | | 6.9 |
| Turbidity | NTU | narrative[2] | | 1.66 |
| Conductivity | uS/cm | ns | | 25 |
| Salinity | ppt | ns | | 0.01 |
| pH | pH | 6.5 - 9.0 | | 5.29 |
| Oxidation Reduction Potential | mV | ns | | 258.6 |

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ns - no standard listed
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[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW28 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | |
| Acidity | mg/L | ns | 5.0 | 19 | 5.8 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 7.2 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 75 | 47 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 9.0 | 7.3 |
| Colour | TCU | narrative [1] | 5.0 | 180 | 180 |
| Total Dissolved Solids | mg/L | ns | 10 | 60 | 59 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 30 (1) | 19 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 4.36 | 6.17 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 4.4 | 5.1 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | <0.0050 | 0.79 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | 1.5 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 52 | 35 |
| **Calculated Parameters** | | | | | |
| Anion Sum | me/L | ns | N/A | 0.250 | 0.350 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 7.1 |
| Calculated TDS | mg/L | ns | 1.0 | 21 | 25 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.370 | 0.410 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 6.1 | 12 |
| Ion Balance (% Difference) | % | ns | N/A | 19.4 | 7.89 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -3.95 |
| Langelier Index (@ 4C) | N/A | ns | | NC | -4.20 |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 10.1 |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.4 |
| **Radionuclide** | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.336 | 0.094 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.978 | 0.114 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | |
| Temperature | °C | narrative [1] | | 11.6 | 3.4 |
| Pressure | mmHg | ns | | 742.1 | 738.1 |
| Dissolved Oxygen | % | ns | | 69.9 | 88.9 |
| Dissolved Oxygen | mg/L | narrative [3] | | 7.42 | 11.51 |
| Turbidity | NTU | narrative [2] | | 1.02 | 1.88 |
| Conductivity | uS/cm | ns | | 43 | 23 |
| Salinity | ppt | ns | | 0.03 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.9 | 5.79 |
| Oxidation Reduction Potential | mV | ns | | 307 | 257.3 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW29 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | 8.0 | 6.8 | 13 | 8.6 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 23 | 36 | 65 | 44 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.2 | 3.7 | 5.4 | 5.5 |
| Colour | TCU | narrative [1] | 5.0 | 0.0 | 150 | 180 | 160 |
| Total Dissolved Solids | mg/L | ns | 10 | 28 | 21 | 51 | 34 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.052 | <0.050 | <0.050 | 0.053 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.9 | 11 | 24 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.00 | 5.20 | 4.89 | 4.62 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.7 | 1.5 | 2.6 | 4.0 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 1.8 | <1.0 | 1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.3 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.81 | 1.2 | <0.0050 | 0.96 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 1.1 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 18 | 33 | 31 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0700 | 0.100 | 0.150 | 0.210 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 7.0 | 8.0 | 13 | 17 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.120 | 0.140 | 0.260 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.5 | 1.9 | 4.3 | 3.6 |
| Ion Balance (% Difference) | % | ns | N/A | 26.3 | 16.7 | 26.8 | 6.67 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.052 | <0.050 | <0.050 | 0.053 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.739 | 1.37 | 1.2 | 1.23 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.728 | 2.55 | 3.66 | 1.86 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 7.6 | 18.9 | 16.4 | 0.7 |
| Pressure | mmHg | ns | | 734.6 | 757.3 | --- | 752.7 |
| Dissolved Oxygen | % | ns | | 93.1 | 71.7 | --- | 88.1 |
| Dissolved Oxygen | mg/L | narrative [3] | | 10.76 | 6.71 | --- | 12.5 |
| Turbidity | NTU | narrative [2] | | 0.71 | 1.4 | 1.14 | 1.04 |
| Conductivity | uS/cm | ns | | 14.2 | 16.7 | 40 | 18.5 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.01 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.31 | 3.82 | 3.64 | 3.95 |
| Oxidation Reduction Potential | mV | ns | | 295.4 | 348.9 | --- | 312.8 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW30 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | 8.0 | 13 | 19 | 8.4 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 21 | 38 | 63 | 49 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.0 | 4.5 | 5.9 | 5.7 |
| Colour | TCU | narrative [1] | 5.0 | 0.0 | 140 | 180 | 120 |
| Total Dissolved Solids | mg/L | ns | 10 | 28 | 30 | 54 | <20 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | 0.063 | <0.050 | 0.064 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | 0.072 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.5 | 11 | 23 | 15 (1) |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | 0.014 | 0.015 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.01 | 5.73 | 4.80 | 4.71 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.041 | <0.020 | 0.021 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.9 | 5.8 | 5.0 | 5.2 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.4 | 1.4 | <1.0 | 4.2 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 3.0 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.36 | 3.1 | <0.0050 | 3.6 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 0.51 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 20 | 23 | 34 | 31 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.130 | 0.170 | 0.230 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 15 | 17 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.200 | 0.300 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.9 | 3.3 | 5.4 | 3.5 |
| Ion Balance (% Difference) | % | ns | N/A | 30.4 | 21.2 | 27.7 | 2.13 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | 0.063 | <0.050 | 0.064 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 3.8 | 0.739 | 0.223 | 2.21 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 3.05 | 1.21 | 0.449 | 3.71 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 5.2 | 10.9 | 14.6 | 2 |
| Pressure | mmHg | ns | | 734.7 | 756.9 | --- | 752.8 |
| Dissolved Oxygen | % | ns | | 80.5 | 41.2 | --- | 69.6 |
| Dissolved Oxygen | mg/L | narrative [3] | | 9.38 | 4.89 | --- | 9.34 |
| Turbidity | NTU | narrative [2] | | 1.68 | 5.12 | 4.85 | 0.82 |
| Conductivity | uS/cm | ns | | 15.2 | 17.9 | 42 | 19 |
| Salinity | ppt | ns | | 0.01 | 0.01 | 0.02 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.63 | 4.06 | 4.2 | 4.37 |
| Oxidation Reduction Potential | mV | ns | | 290.2 | 300 | --- | 298.4 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1: General Chemistry**

| | | CCME FWAL | RDL | SW31 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20 (DUP)]** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | |
| Acidity | mg/L | ns | 5.0 | 7.6 | 8.2 | 8.6 | 18 | 11 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 33 | 38 | 40 | 86 | 51 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.7 | 4.6 | 4.6 | 7.0 | 6.1 |
| Colour | TCU | narrative [1] | 5.0 | 0.0 | 170 | 160 | 210 | 180 |
| Total Dissolved Solids | mg/L | ns | 10 | 32 | 35 | 31 | 73 | 33 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | 0.061 | 0.063 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 9.5 | 12 | 13 | 34 | 21 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | 0.015 | 0.016 | 0.012 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 4.72 | 5.02 | 4.87 | 4.34 | 4.40 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.033 | 0.037 | <0.020 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 3.5 | 6.6 | 6.7 | 6.1 | 6.0 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | <1.0 | 1.4 | 1.0 | <1.0 | 1.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.1 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 0.58 | 1.2 | 1.1 | <0.0050 | 0.38 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | <0.0030 | 0.67 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 23 | 25 | 24 | 47 | 38 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.140 | 0.130 | 0.200 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 15 | 15 | 19 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.180 | 0.180 | 0.330 | 0.270 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.5 | 2.1 | 2.1 | 4.7 | 3.4 |
| Ion Balance (% Difference) | % | ns | N/A | 30.4 | 12.5 | 16.1 | 24.5 | 10.2 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | 0.061 | 0.063 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| **Radionuclide** | | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.187 | 0.73 | 0.868 | 0.061 | 0.041 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.199 | 1.12 | 1.33 | 0.16 | 0.06 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | | |
| Temperature | °C | narrative [1] | | 4 | 9.6 | - | 14.3 | 1.7 |
| Pressure | mmHg | ns | | 736.4 | 758.9 | - | --- | 754.3 |
| Dissolved Oxygen | % | ns | | 92.4 | 72.2 | - | --- | 88.2 |
| Dissolved Oxygen | mg/L | narrative [3] | | 11.74 | 8.2 | - | --- | 12.22 |
| Turbidity | NTU | narrative [2] | | 1.55 | 1.23 | - | 0.35 | 0.42 |
| Conductivity | uS/cm | ns | | 17.8 | 18.8 | - | 50 | 25.2 |
| Salinity | ppt | ns | | 0.01 | 0.01 | - | 0.03 | 0.02 |
| pH | pH | 6.5 - 9.0 | | 4.27 | 3.47 | - | 3.89 | 3.79 |
| Oxidation Reduction Potential | mV | ns | | 320.4 | 365.1 | - | --- | 335.3 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-1 General Chemistry**

| | | CCME FWAL | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Acidity | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 14 | 9.7 | <5.0 |
| Total Chemical Oxygen Demand | mg/L | ns | 20 | 26 | 26 | 49 | 42 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.1 | 3.2 | 5.1 | 5.8 |
| Colour | TCU | narrative [1] | 5.0 | 96 | 120 | 140 | 140 |
| Total Dissolved Solids | mg/L | ns | 10 | 38 | 30 | 46 | 35 |
| Dissolved Fluoride (F-) | mg/L | 0.12 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.059 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.6 | 8.7 | 18 | 16 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.39 | 7.28 | 7.19 | 6.19 |
| Total Phosphorus | mg/L | ns | 0.020 | <0.020 | 0.021 | 0.028 | <0.020 |
| Salinity | N/A | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.0 | 3.8 | 4.2 |
| Total Suspended Solids | mg/L | narrative [2] | 1.0 | 1.6 | <2.0 | 28 | 3.2 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.3 | <2.0 | <2.0 | 2.2 |
| Total Cyanide (CN) | mg/L | 0.005 | 0.0050 | <0.0050 | <0.0050 | <0.0030 | <0.0050 |
| Turbidity | NTU | narrative [3] | 0.10 | 1.1 | 1.8 | <0.0050 | 1.7 |
| WAD Cyanide (Free) | mg/L | ns | 0.0030 | <0.0030 | <0.0030 | 7.7 | <0.0030 |
| Conductivity | uS/cm | ns | 1.0 | 18 | 38 | 39 | 30 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.140 | 0.370 | 0.340 | 0.210 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 14 | 9.7 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 11 | 21 | 31 | 20 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.210 | 0.420 | 0.910 | 0.370 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 6.2 | 15 | 37 | 11 |
| Ion Balance (% Difference) | % | ns | N/A | 20.0 | 6.33 | 45.6 | 27.6 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -2.32 | -2.22 | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | -2.57 | -2.47 | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.059 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 9.60 | 9.41 | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | 9.85 | 9.66 | NC |
| **Radionuclide** | | | | | | | |
| Radium -226 | Bq/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Chlolorphyl a** | **Units** | **CCME FWAL** | **RDL** | | | | |
| Chlorophyll a (Acidification Technique) | µg/L | ns | | 0.505 | 1.33 | 2.57 | 0.264 |
| Chlorophyll a (Non-Acidification) | µg/L | ns | | 0.561 | 1.94 | 8.57 | 0.522 |
| **Field Parameters** | **Units** | **CCME FWAL** | | | | | |
| Temperature | °C | narrative [1] | | 6.6 | 20.1 | 13.3 | -0.1 |
| Pressure | mmHg | ns | | 741.6 | 753.7 | 744.5 | 755.1 |
| Dissolved Oxygen | % | ns | | 101.6 | 91.4 | 96.7 | 98.2 |
| Dissolved Oxygen | mg/L | narrative [3] | | 12.18 | 8.23 | 10.12 | 14.31 |
| Turbidity | NTU | narrative [2] | | 2.16 | 2.47 | 16.3 | 3.79 |
| Conductivity | uS/cm | ns | | 13.8 | 36.2 | 26.2 | 16.1 |
| Salinity | ppt | ns | | 0.01 | 0.02 | 0.01 | 0.01 |
| pH | pH | 6.5 - 9.0 | | 5.62 | 6.59 | 5.56 | 5.23 |
| Oxidation Reduction Potential | mV | ns | | 192.4 | 243 | 218 | 266.1 |

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**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
ND- Not Detected
ns - no standard listed
ug/L - microgram per litre
RDL- Reportable Detection Limit
g/L - gram per litre
°C - Degrees Celcius
uS/cm - microsiemens
ppt - parts per trillion

**Narrative (Gen Chem):**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 25 mg/L from background levels for any short-term (24-h period)

[3] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**Narrative (field parameters):**

[1] Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

[3] Lowest acceptable dissolved oxygen concentration:
- for warm water biota: early life stages = 6000 µg/L
- for warm water biota: other life stages = 5500 µg/L
- for cold water biota: early life stages = 9500 µg/L
- for cold water biota: other life stages = 6500 µg/L

**TABLE G.1-2. Filtered General Chemistry**

| | | CCME FWAL | RDL | SW1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | (DUP) | | | (DUP) | | | (DUP) | | | (DUP) | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.5 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.8 | 3.3 | 2.7 | 5.2 | 5.2 | 3.4 | 2.6 | 3.0 | 4.3 | 4.9 | 5.7 | 5.7 |
| Colour | TCU | narrative [1] | 25 | 59 | 73 | 140 | 170 | 130 | 110 | 92 | 92 | 120 | 150 | 140 | 140 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.096 | 0.094 | <0.050 | <0.050 | <0.050 | 0.060 | <0.050 | <0.050 | <0.050 | <0.050 | 0.063 | 0.056 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.0 | 6.9 | 13 | 20 | 14 | 12 | 7.4 | 7.9 | 9.2 | 17 | 16 | 16 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.8 | 6.8 | 15 | 20 | 14 | 12 | 7.7 | 7.7 | 9.2 | 16 | 16 | 16 |
| Orthophosphate (P) | mg/L | ns | 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 |
| pH | pH | 6.5 - 9.0 | N/A | 5.45 | 5.12 | 5.82 | 5.74 | 6.67 | 4.96 | 5.78 | 5.05 | 6.14 | 5.61 | 4.93 | 5.00 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.8 | 1.6 | 3.9 | 2.6 | 2.7 | 1.8 | 1.8 | 1.2 | 3.6 | 4.0 | 4.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.0 | <2.0 | <2.0 | 6.8 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.90 | 0.97 | 0.34 | 0.25 | 0.41 | 0.73 | 0.22 | 0.36 | 0.31 | 0.38 | 0.38 | 1.5 |
| Conductivity | uS/cm | ns | 1.0 | 21 | 20 | 17 | 30 | 36 | 22 | 17 | 17 | 18 | 28 | 30 | 30 |
| **Calculated Parameters** | | | | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.100 | 0.0800 | 0.150 | 0.280 | 0.100 | 0.0700 | 0.130 | 0.120 | 0.140 | 0.310 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 6.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 9.0 | 8.0 | 15 | 19 | 9.0 | 7.0 | 9.0 | 10 | 14 | 22 | 15 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.150 | 0.150 | 0.250 | 0.370 | 0.150 | 0.120 | 0.130 | 0.180 | 0.250 | 0.240 | 0.230 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.3 | 2.4 | 2.6 | 4.7 | 9.7 | 2.6 | 2.0 | 2.0 | 2.9 | 4.7 | 4.1 | 4.1 |
| Ion Balance (% Difference) | % | ns | N/A | 15.4 | 20.0 | 30.4 | 25.0 | 13.9 | 20.0 | 26.3 | 0.00 | 20.0 | 28.2 | 12.7 | 15.0 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | -3.46 | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | -3.72 | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.096 | 0.094 | <0.050 | <0.050 | <0.050 | 0.060 | <0.050 | <0.050 | <0.050 | <0.050 | 0.063 | 0.056 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | 10.1 | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | 10.4 | NC | NC | NC | NC | NC | NC | NC |

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**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.7 | 4.4 | 5.0 | 5.8 |
| Colour | TCU | narrative [1] | 25 | 96 | 120 | 150 | 150 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.055 | <0.050 | <0.050 | 0.062 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.5 | 9.5 | 17 | 16 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.9 | 9.1 | 17 | 16 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.71 | 6.65 | 5.72 | 5.16 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.3 | 3.8 | 4.1 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.1 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.13 | 0.37 | 0.61 | 0.26 |
| Conductivity | uS/cm | ns | 1.0 | 16 | 24 | 28 | 29 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.120 | 0.120 | 0.140 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 11 | 15 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.240 | 0.280 | 0.260 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.8 | 6.1 | 6.4 | 5.8 |
| Ion Balance (% Difference) | % | ns | N/A | 7.69 | 33.3 | 33.3 | 20.9 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.055 | <0.050 | <0.050 | 0.062 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |

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**Notes:**

mg/L - milligrams per litre
me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW2A | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **2-Dec-19** |
| **Inorganics** | **Units** | | | | | | **(DUP)** | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.3 | 2.7 | 3.9 | 3.3 | 3.4 |
| Colour | TCU | narrative [1] | 25 | 69 | 150 | 190 | 120 | 110 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.056 | <0.050 | <0.050 | 0.056 | 0.063 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 6.9 | 14 | 20 | 13 | 13 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.1 | 15 | 20 | 12 | 13 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.46 | 5.86 | 5.77 | 5.16 | 4.86 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.9 | 1.7 | 3.3 | 2.7 | 3.1 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.10 | 0.49 | 0.36 | 0.43 | 0.78 |
| Conductivity | uS/cm | ns | 1.0 | 21 | 18 | 31 | 23 | 23 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.100 | 0.0800 | 0.110 | 0.100 | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 8.0 | 12 | 9.0 | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.140 | 0.240 | 0.150 | 0.160 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.2 | 2.3 | 4.3 | 2.4 | 2.4 |
| Ion Balance (% Difference) | % | ns | N/A | 20.0 | 27.3 | 37.1 | 20.0 | 23.1 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.056 | <0.050 | <0.050 | 0.056 | 0.063 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |

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TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW4A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.6 | 2.9 | 5.0 | 3.9 | 2.8 | 3.9 | 5.7 | 6.0 |
| Colour | TCU | narrative [1] | 25 | 62 | 130 | 180 | 91 | 86 | 150 | 180 | 120 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.071 | <0.050 | <0.050 | 0.057 | <0.050 | <0.050 | <0.050 | 0.079 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 6.5 | 13 | 18 | 11 | 6.7 | 12 | 21 | 14 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.1 | 14 | 20 | 11 | 6.7 | 11 | 19 | 14 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.71 | 5.78 | 5.43 | 5.02 | 5.39 | 6.09 | 5.00 | 4.89 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.2 | 1.7 | 3.1 | 2.5 | 2.0 | 1.3 | 3.9 | 4.3 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.2 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.11 | 0.31 | 0.36 | 0.21 | <0.10 | 0.64 | 0.64 | 0.25 |
| Conductivity | uS/cm | ns | 1.0 | 21 | 19 | 35 | 23 | 17 | 23 | 31 | 30 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0800 | 0.140 | 0.160 | 0.0800 | 0.110 | 0.160 | 0.180 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 8.0 | 14 | 12 | 8.0 | 10 | 15 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.150 | 0.160 | 0.300 | 0.160 | 0.130 | 0.210 | 0.270 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.5 | 2.7 | 5.9 | 2.8 | 2.2 | 3.3 | 4.9 | 4.2 |
| Ion Balance (% Difference) | % | ns | N/A | 15.4 | 33.3 | 36.4 | 0.00 | 23.8 | 31.3 | 25.6 | 14.3 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.071 | <0.050 | <0.050 | 0.057 | <0.050 | <0.050 | <0.050 | 0.079 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

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me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW5 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | (DUP) | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 8.1 | 7.6 | 29 | 6.1 | <5.0 | 9.6 | 9.7 | 7.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.2 | 2.7 | 2.6 | 3.8 | 3.6 | 2.6 | 3.9 | 4.2 | 6.5 |
| Colour | TCU | narrative [1] | 25 | 16 | 18 | 18 | 170 | 23 | 21 | 29 | 25 | 27 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.10 | <0.050 | <0.050 | <0.050 | 0.078 | <0.050 | <0.050 | <0.050 | 0.060 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.11 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 2.9 | 4.1 | 4.3 | 5.9 | 3.6 | 2.7 | 3.6 | 5.0 | 4.3 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 2.8 | 4.8 | 4.4 | 6.1 | 4.0 | 2.9 | 3.8 | 4.4 | 5.2 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | 0.059 | <0.010 | <0.010 | <0.010 | 0.011 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.49 | 6.76 | 6.89 | 6.66 | 6.73 | 6.46 | 6.82 | 6.80 | 6.66 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.7 | 1.1 | 1.1 | 7.8 | 3.1 | 1.6 | 0.76 | 2.0 | 3.4 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.8 | 3.1 | 3.3 | 12 | 5.8 | 4.4 | 3.8 | 3.8 | 7.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.12 | 0.84 | 0.28 | 0.29 | 0.42 | 0.11 | 0.42 | 0.54 | 0.18 |
| Conductivity | uS/cm | ns | 1.0 | 26 | 33 | 32 | 99 | 35 | 26 | 35 | 36 | 44 |
| **Calculated Parameters** | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.160 | 0.300 | 0.290 | 0.950 | 0.350 | 0.160 | 0.380 | 0.390 | 0.470 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 8.1 | 7.6 | 29 | 6.1 | <1.0 | 9.6 | 9.7 | 7.0 |
| Calculated TDS | mg/L | ns | 1.0 | 13 | 18 | 18 | 65 | 23 | 13 | 21 | 23 | 30 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.230 | 0.300 | 0.310 | 1.10 | 0.310 | 0.230 | 0.330 | 0.350 | 0.400 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 6.8 | 10 | 10 | 38 | 10 | 7.2 | 11 | 10 | 13 |
| Ion Balance (% Difference) | % | ns | N/A | 18.0 | 0.00 | 3.33 | 7.32 | 6.06 | 18.0 | 7.04 | 5.41 | 8.05 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -3.11 | -3.00 | -2.09 | -3.28 | NC | -2.97 | -3.01 | -3.19 |
| Langelier Index (@ 4C) | N/A | ns | | NC | -3.36 | -3.25 | -2.35 | -3.53 | NC | -3.22 | -3.27 | -3.44 |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.10 | <0.050 | <0.050 | <0.050 | 0.078 | <0.050 | <0.050 | <0.050 | 0.060 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 9.87 | 9.89 | 8.75 | 10.0 | NC | 9.78 | 9.82 | 9.85 |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.1 | 10.1 | 9.00 | 10.3 | NC | 10.0 | 10.1 | 10.1 |

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**Notes:**

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TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW5A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.1 | 4.3 | 5.2 | 5.6 |
| Colour | TCU | narrative [1] | 25 | 92 | 130 | 160 | 110 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.066 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.8 | 9.0 | 18 | 12 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.3 (1) | 9.2 | 17 | 12 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.30 | 6.01 | 5.27 | 5.35 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.9 | 1.3 | 3.9 | 4.3 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.26 | 0.71 | 0.46 | 0.35 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 19 | 41 | 29 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0900 | 0.120 | 0.150 | 0.160 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 8.0 | 9.0 | 15 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.130 | 0.170 | 0.270 | 0.260 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.0 | 2.8 | 4.8 | 5.8 |
| Ion Balance (% Difference) | % | ns | N/A | 18.2 | 17.2 | 28.6 | 23.8 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.066 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |

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TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
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**Narrative:**

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**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW6A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.6 | 2.9 | 4.3 | 4.1 | 2.5 | 3.3 | 5.3 | 6.2 |
| Colour | TCU | narrative [1] | 25 | 43 | 99 | 130 | 94 | 78 | 120 | 110 | 120 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 2.9 | <0.050 | <0.050 | 0.060 | 0.067 | 0.052 | <0.050 | 0.068 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.065 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 5.8 | 11 | 12 | 11 | 6.6 | 11 | 15 | 13 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 5.7 | 12 | 12 | 11 | 6.6 | 9.5 | 13 | 14 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 4.13 | 6.13 | 5.98 | 5.60 | 5.96 | 5.87 | 5.84 | 5.46 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.0 | 1.7 | 2.3 | 2.6 | 1.1 | 1.5 | 2.3 | 4.5 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 3.2 |
| Turbidity | NTU | narrative [2] | 0.10 | <0.10 | 0.43 | 0.17 | 0.67 | 0.16 | 0.74 | 0.37 | 0.36 |
| Conductivity | uS/cm | ns | 1.0 | 81 | 17 | 25 | 22 | 17 | 20 | 46 | 31 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.310 | 0.0800 | 0.120 | 0.120 | 0.0700 | 0.100 | 0.150 | 0.250 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 22 | 8.0 | 11 | 11 | 7.0 | 9.0 | 13 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.220 | 0.160 | 0.220 | 0.170 | 0.140 | 0.190 | 0.260 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.5 | 2.8 | 3.8 | 3.2 | 2.3 | 2.9 | 5.2 | 4.5 |
| Ion Balance (% Difference) | % | ns | N/A | 17.0 | 33.3 | 29.4 | 17.2 | 33.3 | 31.0 | 26.8 | 2.04 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 2.9 | <0.050 | <0.050 | 0.060 | 0.067 | 0.052 | <0.050 | 0.068 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |

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TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW9 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | 6.7 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 5.9 | 5.3 | 4.8 | 5.7 |
| Colour | TCU | narrative [1] | 25 | 72 | 110 | 140 | 120 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.056 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.4 | 13 | 14 | 13 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.3 | 14 | 14 | 13 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | 0.047 |
| pH | pH | 6.5 - 9.0 | N/A | 5.83 | 6.36 | 6.63 | 5.24 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.9 | 1.8 | 2.8 | 2.3 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.80 | 0.18 | 0.37 | 0.59 |
| Conductivity | uS/cm | ns | 1.0 | 28 | 30 | 36 | 27 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.170 | 0.150 | 0.270 | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | 6.7 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 14 | 13 | 19 | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.270 | 0.290 | 0.370 | 0.210 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 5.0 | 6.3 | 9.7 | 4.1 |
| Ion Balance (% Difference) | % | ns | N/A | 22.7 | 31.8 | 15.6 | 10.5 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | -3.49 | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | -3.74 | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.056 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | 10.1 | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | 10.4 | NC |

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[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW10 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | 11 | 12 | 9.3 | 7.6 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.7 | 3.0 | 3.5 | 3.8 |
| Colour | TCU | narrative [1] | 25 | 29 | 43 | 27 | 42 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.23 | <0.050 | <0.050 | 0.072 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | 0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 2.3 | 4.4 | 4.9 | 4.2 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 2.3 | 4.2 | 5.0 | 4.5 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | 0.015 | 0.010 | 0.015 |
| pH | pH | 6.5 - 9.0 | N/A | 6.32 | 6.74 | 6.73 | 6.35 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 4.2 | 4.6 | 1.5 | 4.6 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 8.0 | 7.9 | 3.2 | 10 |
| Turbidity | NTU | narrative [2] | 0.10 | <0.10 | 0.30 | 0.27 | 0.91 |
| Conductivity | uS/cm | ns | 1.0 | 54 | 50 | 34 | 51 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.510 | 0.490 | 0.350 | 0.480 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | 11 | 12 | 9.3 | 7.6 |
| Calculated TDS | mg/L | ns | 1.0 | 34 | 33 | 21 | 34 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.510 | 0.490 | 0.340 | 0.460 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 18 | 17 | 11 | 15 |
| Ion Balance (% Difference) | % | ns | N/A | 0.00 | 0.00 | 1.45 | 2.13 |
| Langelier Index (@ 20C) | N/A | ns | | -3.18 | -2.72 | -3.07 | -3.38 |
| Langelier Index (@ 4C) | N/A | ns | | -3.44 | -2.97 | -3.32 | -3.63 |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.23 | <0.050 | <0.050 | 0.072 |
| Saturation pH (@ 20C) | N/A | ns | | 9.50 | 9.46 | 9.80 | 9.73 |
| Saturation pH (@ 4C) | N/A | ns | | 9.75 | 9.72 | 10.0 | 9.99 |

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**Notes:**

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me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
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RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW11 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Inorganics** | **Units** | | | | | | | | (DUP) | | | (DUP) | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.8 | 2.4 | 5.3 | 3.6 | 3.1 | 2.7 | 4.0 | 7.0 | 6.7 | 6.8 |
| Colour | TCU | narrative [1] | 25 | 46 | 180 | 230 | 130 | 120 | 120 | 200 | 220 | 170 | 160 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.057 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 5.9 | 17 | 22 | 15 | 9.8 | 9.7 | 14 | 29 (1) | 18 | 18 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.0 | 19 | 23 | 15 | 10 | 9.8 | 15 | 27 | 20 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.20 | 5.23 | 5.49 | 5.16 | 5.12 | 5.21 | 5.95 | 4.72 | 5.85 | 5.45 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.6 | 1.6 | 2.9 | 2.3 | 1.6 | 1.5 | 1.5 | 2.0 | 3.9 | 4.1 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.1 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.14 | 0.28 | 0.36 | 0.11 | 0.24 | 0.23 | 0.36 | 0.36 | 0.64 | 0.27 |
| Conductivity | uS/cm | ns | 1.0 | 24 | 19 | 37 | 25 | 17 | 17 | 20 | 44 | 33 | 32 |
| **Calculated Parameters** | | | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.110 | 0.0700 | 0.150 | 0.100 | 0.130 | 0.0800 | 0.110 | 0.200 | 0.190 | 0.200 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 7.0 | 14 | 9.0 | 10 | 7.0 | 10 | 16 | 17 | 17 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.170 | 0.140 | 0.290 | 0.170 | 0.140 | 0.140 | 0.210 | 0.360 | 0.310 | 0.320 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.9 | 2.2 | 5.6 | 3.3 | 2.8 | 2.6 | 4.7 | 7.6 | 8.3 | 8.3 |
| Ion Balance (% Difference) | % | ns | N/A | 21.4 | 33.3 | 31.8 | 25.9 | 3.70 | 27.3 | 31.3 | 28.6 | 24.0 | 23.1 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.057 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC | NC | NC |

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**Notes:**

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me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW12 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 3.7 | 2.6 | 5.0 | 3.8 | 2.4 | 4.8 | 8.0 | 7.3 |
| Colour | TCU | narrative [1] | 25 | 34 | 180 | 170 | 140 | 67 | 190 | 170 | 87 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 6.3 | <0.050 | <0.050 | <0.050 | 0.084 | <0.050 | <0.050 | <0.050 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | 0.065 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.6 | 18 | 24 | 16 | 7.5 | 14 | 23 | 9.6 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 6.5 | 20 | 23 | 16 | 7.9 | 15 | 25 (1) | 9.4 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 3.4 | 5.34 | 5.14 | 4.61 | 5.84 | 4.99 | 4.43 | 4.71 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 2.3 | 1.5 | 3.4 | 2.6 | 2.1 | 1.4 | 3.4 | 4.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.45 | 0.31 | 0.25 | 1.6 | 0.36 | 0.79 | 0.52 | 0.59 |
| Conductivity | uS/cm | ns | 1.0 | 180 | 21 | 44 | 28 | 18 | 25 | 51 | 34 |
| **Calculated Parameters** | | | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.550 | 0.0700 | 0.140 | 0.110 | 0.0700 | 0.140 | 0.220 | 0.200 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 37 | 7.0 | 14 | 10 | 8.0 | 10 | 18 | 16 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.530 | 0.150 | 0.290 | 0.170 | 0.130 | 0.170 | 0.350 | 0.240 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.6 | 2.0 | 5.1 | 2.3 | 2.0 | 2.2 | 6.5 | 3.6 |
| Ion Balance (% Difference) | % | ns | N/A | 1.85 | 36.4 | 34.9 | 21.4 | 30.0 | 9.68 | 22.8 | 9.09 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 6.3 | <0.050 | <0.050 | <0.050 | 0.084 | <0.050 | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC | NC | NC |

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TCU - Total Colour Units
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RDL - Reportable Detection Limit
ns - no standard listed
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**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW14 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | **(DUP)** | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 9.0 | 7.3 | 7.5 | 9.1 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 2.9 | 4.8 | 4.4 | 4.9 |
| Colour | TCU | narrative [1] | 25 | 19 | 32 | 18 | 19 | 24 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.054 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 2.9 | 4.6 | 4.3 | 4.2 | 4.1 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 2.9 | 4.2 | 3.9 | 3.6 | 4.6 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.44 | 6.91 | 6.54 | 6.73 | 6.66 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.6 | 0.50 | 0.73 | 0.80 | 3.3 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 4.3 | 4.0 | 5.3 | 4.2 | 7.2 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.17 | 0.89 | 0.43 | 0.62 | 0.21 |
| Conductivity | uS/cm | ns | 1.0 | 26 | 35 | 37 | 34 | 44 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.170 | 0.340 | 0.390 | 0.360 | 0.470 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 9.0 | 7.3 | 7.4 | 9.1 |
| Calculated TDS | mg/L | ns | 1.0 | 14 | 20 | 22 | 20 | 29 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.230 | 0.330 | 0.310 | 0.310 | 0.400 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 7.3 | 11 | 8.3 | 8.2 | 13 |
| Ion Balance (% Difference) | % | ns | N/A | 15.0 | 1.49 | 11.4 | 7.46 | 8.05 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -2.90 | -3.53 | -3.33 | -3.07 |
| Langelier Index (@ 4C) | N/A | ns | | NC | -3.16 | -3.78 | -3.58 | -3.32 |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 0.054 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 9.81 | 10.1 | 10.1 | 9.73 |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.1 | 10.3 | 10.3 | 9.98 |

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**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW19 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | **(DUP)** | | **(DUP)** | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.6 | 3.8 | 3.8 | 6.0 | 6.1 | 5.6 |
| Colour | TCU | narrative [1] | 25 | 97 | 160 | 170 | 190 | 250 | 160 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | 0.053 | 0.050 | 0.053 | <0.050 | 0.057 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.9 | 10 | 10 | 26 | 26 | 17 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.1 | 11 | 11 | 25 | 24 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.41 | 5.21 | 5.09 | 4.65 | 4.59 | 4.73 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.5 | 1.5 | 3.9 | 4.1 | 4.1 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.6 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.24 | 0.63 | 0.98 | 0.67 | 1.3 | 0.26 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 19 | 19 | 40 | 38 | 32 |
| **Calculated Parameters** | | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0700 | 0.110 | 0.110 | 0.170 | 0.170 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 7.0 | 9.0 | 9.0 | 16 | 16 | 17 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.120 | 0.150 | 0.150 | 0.300 | 0.300 | 0.230 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.8 | 2.0 | 1.9 | 5.2 | 5.3 | 3.6 |
| Ion Balance (% Difference) | % | ns | N/A | 26.3 | 15.4 | 15.4 | 27.7 | 27.7 | 2.22 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | 0.053 | 0.050 | 0.053 | <0.050 | 0.057 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC | NC |

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**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW26 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 3.3 | 6.4 | 5.5 |
| Colour | TCU | narrative [1] | 25 | 87 | 140 | 160 | 73 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.053 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.5 | 9.9 | 20 | 12 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.7 | 10 | 21 (1) | 13 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.22 | 5.59 | 5.00 | 5.33 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.8 | 1.3 | 3.8 | 4.6 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | 2.4 | <2.0 | <2.0 | 2.9 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.21 | 0.74 | 1.7 | 0.19 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 19 | 31 | 27 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.130 | 0.0900 | 0.180 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 10 | 8.0 | 16 | 18 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.130 | 0.170 | 0.260 | 0.210 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 2.0 | 2.6 | 4.6 | 4.3 |
| Ion Balance (% Difference) | % | ns | N/A | 0.00 | 30.8 | 18.2 | 2.33 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.053 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |

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**Notes:**

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uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW28 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 7.1 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 8.5 | 7.3 |
| Colour | TCU | narrative [1] | 25 | 200 | 190 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | 0.052 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 30 | 20 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 29 | 20 |
| Orthophosphate (P) | mg/L | ns | 0.010 | 0.034 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 4.39 | 6.19 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 4.5 | 5.1 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.83 | 1.9 |
| Conductivity | uS/cm | ns | 1.0 | 54 | 37 |
| **Calculated Parameters** | | | | | |
| Anion Sum | me/L | ns | N/A | 0.240 | 0.350 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 7.1 |
| Calculated TDS | mg/L | ns | 1.0 | 21 | 25 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.390 | 0.400 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 6.4 | 12 |
| Ion Balance (% Difference) | % | ns | N/A | 23.8 | 6.67 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -3.90 |
| Langelier Index (@ 4C) | N/A | ns | | NC | -4.15 |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | 0.052 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 10.1 |
| Saturation pH (@ 4C) | N/A | ns | | NC | 10.3 |

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TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW29 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.2 | 3.7 | 5.5 | 5.5 |
| Colour | TCU | narrative [1] | 25 | 99 | 160 | 180 | 160 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.064 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 8.2 | 11 | 23 | 18 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.4 | 11 | 20 | 18 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.17 | 5.13 | 4.60 | 5.63 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.6 | 1.5 | 2.5 | 4.0 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.24 | 0.62 | 0.21 | 0.14 |
| Conductivity | uS/cm | ns | 1.0 | 17 | 18 | 35 | 32 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0600 | 0.100 | 0.150 | 0.160 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 6.0 | 8.0 | 13 | 14 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.120 | 0.140 | 0.270 | 0.210 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.6 | 2.0 | 4.4 | 3.4 |
| Ion Balance (% Difference) | % | ns | N/A | 33.3 | 16.7 | 28.6 | 13.5 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.064 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |

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TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW30 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.4 | 4.7 | 6.0 | 5.9 |
| Colour | TCU | narrative [1] | 25 | 100 | 150 | 170 | 130 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | 0.16 | 0.067 | <0.050 | 0.094 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | 0.057 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.5 | 10 | 24 | 17 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 7.7 | 11 | 20 | 17 |
| Orthophosphate (P) | mg/L | ns | 0.010 | 0.011 | 0.018 | 0.015 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 5.09 | 5.49 | 4.73 | 5.25 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 3.0 | 5.8 | 5.0 | 5.3 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.2 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.12 | 0.34 | 0.38 | 0.44 |
| Conductivity | uS/cm | ns | 1.0 | 20 | 23 | 36 | 36 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.140 | 0.170 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 15 | 17 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.210 | 0.300 | 0.230 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.9 | 3.4 | 5.3 | 3.8 |
| Ion Balance (% Difference) | % | ns | N/A | 27.3 | 20.0 | 27.7 | 2.22 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | 0.16 | 0.067 | <0.050 | 0.094 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC |

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**Notes:**

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me/L - milliequivalent per litre
uS/cm - microsiemens
TCU - Total Colour Units
NTU - Nephelometric Turbidity Units
TDS - Total Dissolved Solids
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW31 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | **(DUP)]** | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 4.6 | 4.6 | 6.8 | 7.1 |
| Colour | TCU | narrative [1] | 25 | 110 | 170 | 160 | 190 | 170 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | 0.067 | 0.18 | <0.050 | 0.070 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 9.6 | 12 | 13 | 31 (1) | 21 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 9.5 | 13 | 13 | 29 | 22 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | 0.017 | 0.019 | 0.013 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 4.79 | 4.90 | 4.89 | 4.46 | 5.06 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 3.5 | 6.7 | 6.8 | 6.2 | 5.6 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.43 | 0.53 | 0.98 | 0.36 | 0.76 |
| Conductivity | uS/cm | ns | 1.0 | 23 | 25 | 25 | 50 | 39 |
| **Calculated Parameters** | | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.140 | 0.140 | 0.190 | 0.200 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 9.0 | 16 | 16 | 19 | 18 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.140 | 0.180 | 0.190 | 0.320 | 0.250 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 1.5 | 2.1 | 2.1 | 4.6 | 3.5 |
| Ion Balance (% Difference) | % | ns | N/A | 27.3 | 12.5 | 15.2 | 25.5 | 11.1 |
| Langelier Index (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | 0.067 | 0.18 | <0.050 | 0.070 |
| Saturation pH (@ 20C) | N/A | ns | | NC | NC | NC | NC | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | NC | NC | NC | NC |

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**Narrative:**

[1] Apparent Colour The mean percent transmission of white light per metre shall not be significantly less than the seasonally adjusted expected value for the system under consideration.

[2] Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).

**TABLE G.1-2: Filtered General Chemistry**

| | | CCME FWAL | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Inorganics** | **Units** | | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | ns | 5.0 | <5.0 | 14 | 6.2 | <5.0 |
| Dissolved Chloride (Cl-) | mg/L | 640 | 1.0 | 2.9 | 3.2 | 5.2 | 5.8 |
| Colour | TCU | narrative [1] | 25 | 97 | 120 | 200 | 140 |
| Nitrate + Nitrite (N) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | 0.081 |
| Nitrite (N) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | ns | 0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Dissolved Organic Carbon (C) | mg/L | ns | 0.5 | 7.3 | 9.0 | 18 | 16 |
| Total Organic Carbon (C) | mg/L | ns | 0.50 | 8.0 | 9.2 | 17 | 16 |
| Orthophosphate (P) | mg/L | ns | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| pH | pH | 6.5 - 9.0 | N/A | 6.19 | 7.26 | 6.35 | 5.96 |
| Reactive Silica (SiO2) | mg/L | ns | 0.50 | 1.9 | 1.5 | 3.8 | 4.2 |
| Dissolved Sulphate (SO4) | mg/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.3 |
| Turbidity | NTU | narrative [2] | 0.10 | 0.16 | 0.58 | 0.67 | 0.48 |
| Conductivity | uS/cm | ns | 1.0 | 18 | 39 | 32 | 29 |
| **Calculated Parameters** | | | | | | | |
| Anion Sum | me/L | ns | N/A | 0.0800 | 0.370 | 0.270 | 0.220 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | 14 | 6.2 | <1.0 |
| Calculated TDS | mg/L | ns | 1.0 | 8.0 | 21 | 19 | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Cation Sum | me/L | ns | N/A | 0.170 | 0.410 | 0.330 | 0.290 |
| Hardness (CaCO3) | mg/L | ns | 1.0 | 4.6 | 15 | 8.7 | 7.4 |
| Ion Balance (% Difference) | % | ns | N/A | 36.0 | 5.13 | 10.0 | 13.7 |
| Langelier Index (@ 20C) | N/A | ns | | NC | -2.34 | -3.84 | NC |
| Langelier Index (@ 4C) | N/A | ns | | NC | -2.60 | -4.10 | NC |
| Nitrate (N) | mg/L | 13 | 0.050 | <0.050 | <0.050 | <0.050 | 0.081 |
| Saturation pH (@ 20C) | N/A | ns | | NC | 9.60 | 10.2 | NC |
| Saturation pH (@ 4C) | N/A | ns | | NC | 9.86 | 10.4 | NC |

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**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW1 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | 10-Apr-19 | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | (DUP) | | | (DUP) | | | (DUP) | | | (DUP) | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 140 | 130 | 260 | 370 | 250 | 220 | 160 | 150 | 250 | 300 | 280 | 300 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | 2.2 | 2.0 | <1.0 | <1.0 | 1.1 | <1.0 | 3.9 | 1.6 | 1.1 | 1.1 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.3 | 2.1 | 3.1 | 6.0 | 5.5 | 2.8 | 2.2 | 2.1 | 2.7 | 4.4 | 4.2 | 4.3 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 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 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.017 | 0.012 | 0.015 | 0.032 | 0.011 | 0.012 | 0.012 | 0.013 | 0.010 | 0.017 | 0.020 | 0.022 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 510 | 510 | 1300 | 1100 | 2100 | 560 | 430 | 430 | 630 | 1000 | 850 | 910 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | 1.0 | <1.0 | 1.4 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | 0.55 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | 0.45 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | 0.83 | 0.54 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 210 | 210 | 480 | 850 | 700 | 340 | 230 | 220 | 630 | 680 | 510 | 490 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | 0.56 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 270 | 270 | 290 | 540 | 1100 | 290 | 220 | 220 | 290 | 510 | 460 | 490 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 45 | 44 | 38 | 63 | 92 | 32 | 25 | 25 | 39 | 50 | 45 | 45 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 22 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 300 | 330 | 150 | 220 | 220 | 110 | 220 | 230 | 240 | 220 | 230 | 280 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 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 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1800 | 1800 | 1900 | 2900 | 3500 | 1800 | 1700 | 1600 | 2200 | 3000 | 2800 | 2900 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.0 | 4.1 | 5.8 | 10 | 7.7 | 5.3 | 4.2 | 4.2 | 5.2 | 9.3 | 8.4 | 8.2 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 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 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.2 | 2.1 | 3.7 | 4.8 | 5.0 | 3.3 | <2.0 | <2.0 | 4.1 | 3.3 | 2.4 | 3.0 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 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 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**
ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**
[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5
[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 180 | 240 | 410 | 360 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 1.2 | 3.6 | 2.3 | 1.7 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 4.8 | 4.6 | 14 | 7.1 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.012 | 0.010 | 0.016 | 0.024 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 2600 | 2400 | 17000 | 7400 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.50 | 0.47 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | 0.87 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 300 | 570 | 1200 | 720 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | 0.56 | 1.6 | 1.1 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 1300 | 1100 | 9300 | 3900 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 81 | 82 | 430 | 200 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 220 | 250 | 250 | 280 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1700 | 2300 | 2800 | 2900 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 6.1 | 6.7 | 22 | 14 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 4.4 | 2.8 | 4.3 | 3.4 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW2A | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **2-Dec-19** |
| **Metals** | **Units** | | | | | | | **(DUP)** | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 440 | 290 | 370 | 230 | 230 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | 1.1 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.3 | 3.2 | 5.6 | 2.7 | 2.7 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.020 | 0.020 | 0.030 | <0.010 | <0.010 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 510 | 500 | 990 | 520 | 490 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | 1.1 | <1.0 | 1.1 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.45 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | 0.55 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 220 | 580 | 860 | 370 | 350 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | 0.51 | 0.60 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 270 | 260 | 520 | 290 | 280 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 43 | 30 | 54 | 31 | 30 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | 2.9 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 320 | 150 | 190 | 120 | <100 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1800 | 1700 | 2900 | 1800 | 1800 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.8 | 5.0 | 9.8 | 5.7 | 4.8 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | 3.5 | 4.7 | 3.8 | 4.1 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW4A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 130 | 260 | 370 | 170 | 160 | 230 | 290 | 270 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 1.8 | 5.0 | 5.4 | 1.4 | 1.8 | 7.9 | 1.3 | 2.5 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.0 | 2.9 | 5.5 | 2.1 | 1.9 | 2.8 | 3.9 | 3.8 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.014 | 0.014 | 0.022 | 0.010 | 0.013 | <0.010 | 0.016 | 0.016 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 560 | 640 | 1400 | 610 | 520 | 680 | 1000 | 970 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | 1.1 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.77 | <0.40 | <0.40 | 0.50 | <0.40 | 0.48 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 210 | 520 | 840 | 230 | 230 | 800 | 660 | 420 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 0.63 | <0.50 | <0.50 | 0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 270 | 270 | 610 | 300 | 230 | 330 | 510 | 460 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 41 | 32 | 73 | 35 | 24 | 46 | 52 | 44 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 4.7 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 320 | 140 | 260 | <100 | 170 | 270 | 310 | 210 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1900 | 1900 | 3400 | 2000 | 1700 | 2500 | 2800 | 2900 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.4 | 5.1 | 11 | 4.7 | 3.8 | 5.1 | 7.8 | 7.8 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | 2.2 | 5.2 | 3.2 | <2.0 | 3.4 | 2.3 | 2.2 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW5 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | 10-Apr-19 | 12-Jun-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | (DUP) | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 74 | 56 | 59 | 190 | 110 | 78 | 110 | 52 | 83 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 12 | 27 | 28 | 290 | 15 | 18 | 53 | 32 | 22 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 3.3 | 4.4 | 4.4 | 9.3 | 3.2 | 3.3 | 5.1 | 3.4 | 3.9 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | <0.010 | <0.010 | <0.010 | 0.015 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 2000 | 3300 | 3300 | 13000 | 3000 | 2300 | 3300 | 3000 | 3900 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | 2.4 | <0.40 | <0.40 | 0.64 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | 0.78 | 0.65 | 1.9 | 0.68 | <0.50 | 0.85 | 0.82 | 0.56 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 380 | 550 | 560 | 5700 | 420 | 570 | 1400 | 720 | 590 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | 1.3 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 400 | 590 | 570 | 1500 | 540 | 410 | 620 | 650 | 740 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 43 | 66 | 66 | 310 | 22 | 31 | 150 | 81 | 16 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | 7.1 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 420 | 560 | 570 | 1000 | 470 | 370 | 620 | 480 | 600 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1600 | 1900 | 1800 | 2900 | 1900 | 1600 | 2000 | 2500 | 2700 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 9.8 | 17 | 17 | 43 | 15 | 12 | 18 | 17 | 19 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | 4.3 | 2.1 | 2.4 | 3.3 | <2.0 | <2.0 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | 0.19 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW5A | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 150 | 210 | 300 | 240 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 1.5 | 3.2 | 1.2 | 4.7 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.2 | 2.4 | 4.3 | 3.8 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.012 | <0.010 | 0.015 | 0.016 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 520 | 590 | 1000 | 1400 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 230 | 530 | 600 | 420 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 230 | 260 | 510 | 510 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 25 | 33 | 54 | 37 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 220 | 220 | 400 | 290 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1600 | 2100 | 2900 | 2800 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.6 | 4.7 | 9.1 | 11 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.5 | 3.6 | 3.9 | 2.7 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW6A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 140 | 270 | 290 | 260 | 160 | 310 | 320 | 320 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | 3.1 | 4.4 | 1.3 | 1.6 | 12 | 3.2 | 1.5 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.1 | 2.9 | 3.7 | 2.7 | 1.9 | 2.9 | 4.9 | 3.9 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.015 | 0.017 | 0.018 | 0.010 | <0.010 | 0.016 | 0.020 | 0.016 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 570 | 640 | 910 | 720 | 490 | 640 | 1300 | 1000 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | 1.1 | 1.2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.64 | <0.40 | <0.40 | 0.80 | 0.70 | 0.44 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | 0.82 | 0.58 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 180 | 460 | 870 | 340 | 260 | 1600 | 690 | 480 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 0.62 | <0.50 | <0.50 | 0.75 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 270 | 290 | 410 | 330 | 220 | 290 | 520 | 470 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 39 | 35 | 64 | 40 | 22 | 72 | 60 | 47 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 230 | 130 | 180 | <100 | 170 | 220 | 280 | 200 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1800 | 1900 | 2800 | 2000 | 1600 | 2000 | 2900 | 2900 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.9 | 4.9 | 7.1 | 5.6 | 3.8 | 4.7 | 9.4 | 8.2 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | 3.2 | 4.5 | 2.9 | 2.2 | 6.1 | 4.1 | 2.3 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | 0.023 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW9 | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 150 | 250 | 260 | 260 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.9 | 4.4 | 5.9 | 3.8 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.017 | 0.014 | 0.014 | 0.014 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 1100 | 1400 | 2200 | 900 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | 1.2 | 1.4 | 2.1 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | 0.59 | 0.94 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 210 | 320 | 740 | 320 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 540 | 680 | 1200 | 470 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 48 | 50 | 96 | 43 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 300 | 170 | 230 | 160 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 3100 | 3300 | 3700 | 2500 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.4 | 5.3 | 8.3 | 5.0 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.7 | 3.0 | 4.6 | 4.3 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| Sampling Date | | CCME FWAL | Teir 1 EQS | RDL | SW10 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 57 | 130 | 28 | 130 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 42 | 99 | 49 | 71 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 4.6 | 5.6 | 3.1 | 5.0 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.027 | 0.039 | <0.010 | 0.021 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 5500 | 5500 | 3300 | 4800 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | 1.0 | 1.5 | <0.40 | 1.3 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | 1.1 | 2.5 | <0.50 | 1.5 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 1300 | 1500 | 710 | 1700 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | 0.54 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 770 | 740 | 750 | 710 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 89 | 120 | 82 | 100 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | 4.6 | 6.3 | <2.0 | 4.7 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 500 | 610 | 410 | 490 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1900 | 1900 | 2300 | 2000 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 20 | 21 | 19 | 18 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | 5.7 | 10 | <5.0 | 8.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW11 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **21-22-Apr-20 (DUP)** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20 (DUP)** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 280 | 280 | 450 | 500 | 180 | 190 | 270 | 470 | 390 | 400 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | 1.8 | <1.0 | <1.0 | <1.0 | 1.1 | 1.5 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.6 | 1.9 | 4.3 | 3.0 | 1.6 | 1.5 | 2.1 | 5.1 | 3.0 | 3.1 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.018 | 0.011 | 0.026 | 0.019 | <0.010 | <0.010 | 0.013 | 0.027 | 0.019 | 0.015 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 470 | 490 | 1300 | 700 | 540 | 550 | 860 | 1700 | 1600 | 1500 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | 1.1 | 1.1 | 1.6 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | 0.60 | <0.40 | 0.47 | 0.41 | <0.40 | <0.40 | <0.40 | 0.48 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | 0.60 | 0.61 | 0.76 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 240 | 590 | 1200 | 880 | 330 | 350 | 560 | 1100 | 630 | 610 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 0.78 | 0.75 | <0.50 | <0.50 | <0.50 | 0.75 | 0.67 | 0.62 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 410 | 250 | 650 | 460 | 310 | 340 | 510 | 880 | 1100 | 1100 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 34 | 21 | 52 | 33 | 23 | 24 | 33 | 58 | 47 | 47 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 290 | <100 | 320 | <100 | 160 | 160 | 190 | 420 | 170 | 170 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1900 | 1600 | 3100 | 2200 | 1500 | 1600 | 1900 | 3300 | 2900 | 3000 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.1 | 4.0 | 9.6 | 4.7 | 3.3 | 3.4 | 5.2 | 12 | 7.2 | 7.4 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.1 | 2.9 | 6.2 | 6.3 | 2.4 | 2.8 | 2.2 | 4.3 | 3.3 | 3.2 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | 5.9 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**
ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**
[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5
[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW12 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 230 | 310 | 540 | 290 | 270 | 340 | 590 | 360 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | 1.8 | 2.1 | 1.0 | <1.0 | 2.5 | 1.9 | 1.2 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 1.8 | 2.0 | 4.9 | 1.9 | 1.8 | 2.5 | 5.2 | 2.9 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.015 | 0.014 | 0.029 | 0.015 | 0.012 | 0.019 | 0.032 | 0.020 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 510 | 370 | 1000 | 450 | 420 | 410 | 1200 | 650 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | 1.1 | 1.3 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.77 | <0.40 | <0.40 | <0.40 | 0.45 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 310 | 610 | 1000 | 500 | 180 | 610 | 850 | 580 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 0.81 | 0.52 | <0.50 | 0.53 | 0.83 | 0.52 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 290 | 250 | 630 | 290 | 230 | 300 | 800 | 480 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 40 | 20 | 67 | 23 | 17 | 24 | 53 | 30 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 230 | <100 | 210 | <100 | 120 | 300 | 610 | 150 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1900 | 1800 | 3200 | 2400 | 1600 | 2300 | 3400 | 3000 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 2.9 | 3.6 | 8.9 | 3.5 | 2.9 | 4.1 | 10 | 5.9 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.2 | 2.9 | 6.5 | 4.0 | <2.0 | 3.0 | 4.2 | 3.1 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.3 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW14 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | **(DUP)** | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 65 | 87 | 20 | 27 | 73 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 12 | 28 | 7.4 | 7.9 | 19 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 3.3 | 4.5 | 3.2 | 3.1 | 3.7 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 2300 | 3300 | 2200 | 2200 | 4100 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | 0.53 | 0.52 | <0.50 | <0.50 | 0.56 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 450 | 1100 | 290 | 310 | 570 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 400 | 610 | 610 | 640 | 770 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 19 | 100 | 30 | 28 | 8.0 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 350 | 630 | 580 | 610 | 640 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1500 | 2000 | 2700 | 2700 | 2700 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 11 | 18 | 13 | 14 | 20 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable:

5 ug/L if pH < 6.5

100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW19 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | **(DUP)** | | **(DUP)** | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 140 | 200 | 200 | 370 | 370 | 270 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | 1.0 | <1.0 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 1.7 | 2.2 | 2.2 | 5.9 | 6.5 | 3.7 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | <0.010 | 0.011 | 0.011 | 0.023 | 0.028 | 0.014 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 330 | 430 | 430 | 1100 | 1100 | 690 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | 0.43 | 0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 240 | 430 | 430 | 850 | 850 | 580 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | 0.66 | 0.66 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 190 | 230 | 220 | 560 | 570 | 420 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 21 | 27 | 26 | 53 | 59 | 41 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 190 | 170 | 170 | 290 | 340 | 200 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1500 | 1800 | 1800 | 2900 | 3000 | 2600 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.3 | 3.7 | 3.8 | 10 | 10 | 7.4 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.5 | <2.0 | 2.5 | 4.3 | 3.7 | 2.5 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable:
5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| Sampling Date | | CCME FWAL | Teir 1 EQS | RDL | SW26 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 150 | 330 | 320 | 270 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 1.0 | 14 | <1.0 | 4.3 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.0 | 3.0 | 4.7 | 4.3 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.011 | 0.018 | 0.020 | 0.020 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 410 | 580 | 1000 | 950 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | 0.59 | 1.1 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 210 | 650 | 720 | 280 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | 0.57 | <0.50 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 210 | 290 | 510 | 480 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 23 | 32 | 48 | 27 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 200 | 260 | 250 | 200 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1600 | 2100 | 2900 | 2800 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.8 | 5.0 | 9.1 | 8.5 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.3 | 5.9 | 3.2 | 2.1 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | 6.7 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW28 | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 520 | 370 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 4.7 | 3.1 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 4.7 | 2.4 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.028 | 0.012 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 1200 | 2200 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | 0.66 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 1100 | 670 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | 0.74 | 0.67 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 750 | 1500 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 70 | 61 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 450 | 170 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 3600 | 3200 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 12 | 6.9 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 5.3 | 4.3 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| Sampling Date | | CCME FWAL | Teir 1 EQS | RDL | SW29 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 140 | 200 | 370 | 300 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 1.7 | 2.1 | 5.2 | 3.8 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | <0.010 | 0.011 | 0.020 | 0.015 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 320 | 400 | 840 | 690 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 250 | 450 | 860 | 600 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 0.66 | <0.50 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 180 | 210 | 530 | 460 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 20 | 24 | 49 | 41 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 170 | 170 | 220 | 190 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1400 | 1700 | 2900 | 2800 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.3 | 4.0 | 8.8 | 7.3 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.5 | 2.6 | 4.5 | 2.9 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| Sampling Date | | CCME FWAL | Teir 1 EQS | RDL | SW30 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 140 | 230 | 330 | 280 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 2.9 | 7.0 | 8.6 | 4.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 2.0 | 3.4 | 4.8 | 4.0 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.018 | 0.022 | 0.029 | 0.031 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 390 | 830 | 1300 | 700 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.53 | 0.49 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 160 | 470 | 800 | 430 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | 0.54 | 0.60 | 0.57 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 220 | 310 | 530 | 430 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 27 | 37 | 62 | 46 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 270 | 230 | 300 | 320 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 2000 | 2400 | 3200 | 3000 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.2 | 6.1 | 8.7 | 6.5 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 2.3 | 3.2 | 3.3 | 2.9 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| | | CCME FWAL | Teir 1 EQS | RDL | SW31 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20 (DUP)]** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 160 | 220 | 230 | 480 | 340 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | <1.0 | 2.1 | 2.0 | 2.0 | <1.0 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 1.5 | 2.0 | 2.0 | 5.0 | 3.3 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.016 | 0.015 | 0.016 | 0.037 | 0.028 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 300 | 450 | 470 | 910 | 630 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 120 | 240 | 240 | 580 | 310 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | <0.50 | 0.75 | 0.52 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 190 | 240 | 240 | 590 | 460 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 11 | 13 | 12 | 27 | 19 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 280 | 300 | 300 | 410 | 240 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 2000 | 2500 | 2400 | 3600 | 3300 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 3.0 | 4.0 | 4.0 | 9.7 | 6.7 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 3.1 | 2.8 | 2.6 | 4.2 | 3.8 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | 0.11 | 0.24 | 0.23 | 0.25 | 0.16 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable:
5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-3: Total Metals**

| Sampling Date | | CCME FWAL | Teir 1 EQS | RDL | SW32 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | |
| Total Aluminum (Al) | ug/L | Narrative [1] | 5 | 5.0 | 160 | 160 | 430 | 310 |
| Total Antimony (Sb) | ug/L | ns | 20 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | 5 | 5 | 1.0 | 1.0 | 3.2 | 2.8 | 1.2 |
| Total Barium (Ba) | ug/L | ns | 1000 | 1.0 | 3.5 | 5.9 | 11 | 5.2 |
| Total Beryllium (Be) | ug/L | ns | 5.3 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Boron (B) | ug/L | 1,500 | 1200 | 50 | <50 | <50 | <50 | <50 |
| Total Cadmium (Cd) | ug/L | Narrative [2] | 0.04 | 0.010 | 0.010 | 0.010 | 0.017 | 0.027 |
| Total Calcium (Ca) | ug/L | ns | | 100 | 1400 | 3500 | 8100 | 2300 |
| Total Chromium (Cr) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | ns | 10 | 0.40 | <0.40 | <0.40 | 0.70 | 0.46 |
| Total Copper (Cu) | ug/L | Narrative [2] | 2 | 0.50 | <0.50 | <0.50 | 0.80 | <0.50 |
| Total Iron (Fe) | ug/L | 300 | 300 | 50 | 230 | 410 | 1100 | 570 |
| Total Lead (Pb) | ug/L | Narrative [2] | 1 | 0.50 | <0.50 | <0.50 | 1.4 | 0.57 |
| Total Magnesium (Mg) | ug/L | ns | | 100 | 650 | 1600 | 4100 | 1200 |
| Total Manganese (Mn) | ug/L | ns | 820 | 2.0 | 45 | 39 | 300 | 84 |
| Total Molybdenum (Mo) | ug/L | 73 | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | Narrative [2] | 25 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | ns | | 100 | <100 | <100 | <100 | <100 |
| Total Potassium (K) | ug/L | ns | | 100 | 210 | 260 | 230 | 280 |
| Total Selenium (Se) | ug/L | 1 | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Total Silver (Ag) | ug/L | 0.25 | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | ns | | 100 | 1700 | 2000 | 2800 | 2900 |
| Total Strontium (Sr) | ug/L | ns | 21000 | 2.0 | 4.7 | 7.8 | 14 | 9.7 |
| Total Thallium (Tl) | ug/L | 0.8 | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | ns | | 2.0 | 5.7 | 2.6 | 4.6 | 2.4 |
| Total Tungsten (W) | ug/L | ns | | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Uranium (U) | ug/L | 15 | 300 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | ns | 6 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zirconium | ug/L | ns | | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | 30 | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Total Mercury (Hg) | ug/L | 0.026 | | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL) or Teir 1 EQS guidelines**

**Notes:**

ug/L - microgram per litre

RDL - Reportable Detection Limit

ns - no standard listed

NC - Not Calculated

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW1 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | (DUP) | | | (DUP) | | | (DUP) | | | (DUP) | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 130 | 240 | 340 | 210 | 210 | 140 | 140 | 190 | 280 | 280 | 280 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | <1.0 | 1.8 | 1.8 | <1.0 | <1.0 | <1.0 | <1.0 | 3.1 | 1.2 | <1.0 | 1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.2 | 2.2 | 3.1 | 6.1 | 5.4 | 2.7 | 2.0 | 1.9 | 2.6 | 4.4 | 4.1 | 4.3 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.014 | 0.010 | 0.020 | 0.025 | 0.016 | 0.016 | 0.012 | 0.015 | 0.010 | 0.015 | 0.017 | 0.022 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 480 | 480 | 600 | 1000 | 2100 | 550 | 450 | 440 | 680 | 1100 | 850 | 850 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | 1.2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | 0.49 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 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 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 190 | 190 | 360 | 680 | 430 | 310 | 200 | 200 | 350 | 530 | 440 | 450 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 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 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 280 | 290 | 270 | 510 | 1000 | 290 | 220 | 210 | 290 | 500 | 480 | 470 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 47 | 47 | 35 | 61 | 59 | 31 | 23 | 23 | 38 | 44 | 46 | 50 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 5.5 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 330 | 320 | 150 | 230 | 260 | 150 | 220 | 200 | 250 | 270 | 260 | 250 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 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 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1900 | 1900 | 1800 | 2900 | 3500 | 1800 | 1600 | 1500 | 2400 | 3000 | 2800 | 2700 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.2 | 4.5 | 5.4 | 9.9 | 7.6 | 4.7 | 4.1 | 3.9 | 5.5 | 9.1 | 8.2 | 8.5 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 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 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.7 | 2.1 | 2.3 | <2.0 | <2.0 | 2.1 | 3.0 | 2.6 | 2.1 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.16 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 9.8 | 6.3 | <5.0 | <5.0 | <5.0 | 5.3 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | ~0.07 | ~0.07 | 0.26 | 0.30 | 0.28 | 0.07 | 0.07 | 0.08 | 0.36 | 0.42 | 0.11 | 0.09 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**
ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**
[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5
[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW1A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 140 | 190 | 290 | 280 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 3.3 | 1.2 | 1.1 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.4 | 3.5 | 4.7 | 4.4 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | 0.015 | 0.020 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 630 | 1500 | 1500 | 1300 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 200 | 370 | 520 | 460 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 300 | 580 | 640 | 600 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 31 | 54 | 59 | 58 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | 6.3 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 200 | 260 | 270 | 240 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 2200 | 2900 | 2700 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.1 | 6.2 | 9.0 | 9.1 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.0 | 2.8 | 2.6 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 5.7 | <5.0 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.09 | 0.40 | 0.40 | 0.12 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW2A | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **2-Dec-19** |
| **Metals** | **Units** | | | | | | **(DUP)** | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 240 | 340 | 220 | 220 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | <1.0 | 1.1 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.2 | 2.9 | 5.9 | 2.7 | 2.6 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.014 | 0.019 | 0.024 | <0.010 | 0.012 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 430 | 500 | 920 | 500 | 490 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | 1.0 | 1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | 0.47 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 200 | 380 | 680 | 330 | 340 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 280 | 260 | 500 | 280 | 290 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 46 | 30 | 53 | 29 | 30 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.1 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 310 | 150 | 230 | 150 | 150 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1900 | 1800 | 2800 | 1800 | 1800 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.0 | 4.9 | 9.7 | 4.8 | 4.5 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.9 | 2.6 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | 5.3 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.39 | 0.27 | 0.07 | 0.07 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW4A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 250 | 310 | 170 | 150 | 220 | 300 | 270 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 1.9 | 4.6 | 4.9 | 1.4 | 1.7 | 8.3 | 1.3 | 2.6 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.0 | 2.8 | 5.6 | 2.3 | 2.0 | 3.2 | 4.5 | 3.7 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative[2] | 0.010 | 0.010 | 0.013 | 0.021 | 0.013 | <0.010 | 0.013 | 0.017 | 0.018 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 530 | 630 | 1400 | 620 | 490 | 750 | 1000 | 920 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.0 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | 0.73 | <0.40 | <0.40 | 0.45 | <0.40 | 0.45 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 190 | 450 | 700 | 220 | 210 | 730 | 650 | 400 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.51 | <0.50 | <0.50 | 0.51 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 280 | 280 | 580 | 300 | 230 | 360 | 570 | 460 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 42 | 32 | 68 | 36 | 23 | 49 | 57 | 45 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 300 | 180 | 280 | 120 | 180 | 340 | 320 | 210 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 2000 | 1900 | 3400 | 2000 | 1700 | 2500 | 3100 | 2900 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.1 | 5.0 | 11 | 4.7 | 3.9 | 5.7 | 8.4 | 8.1 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 2.5 | <2.0 | <2.0 | 3.5 | 3.7 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 10 | 6.2 | 5.1 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.11 | 0.56 | 0.60 | 0.13 | 0.26 | 1.45 | 0.35 | 0.23 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW5 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | (DUP) | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 47 | 27 | 27 | 150 | 71 | 40 | 29 | 30 | 54 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 9.0 | 12 | 12 | 280 | 9.3 | 7.8 | 31 | 33 | 23 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 3.3 | 3.7 | 3.8 | 9.7 | 3.1 | 3.2 | 4.5 | 3.3 | 3.7 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | 0.013 | 0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 2000 | 3200 | 3200 | 13000 | 3100 | 2200 | 3300 | 3000 | 4000 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | 2.4 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | 0.66 | 0.64 | 0.98 | 0.56 | <0.50 | 0.70 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 230 | 210 | 220 | 5300 | 240 | 220 | 550 | 410 | 360 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | 0.74 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 420 | 560 | 570 | 1400 | 560 | 400 | 600 | 680 | 730 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 44 | 30 | 30 | 310 | 9.0 | 15 | 50 | 75 | 20 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | 6.8 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 420 | 540 | 540 | 1000 | 470 | 350 | 590 | 540 | 590 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1700 | 1800 | 1800 | 2800 | 2000 | 1600 | 1900 | 2500 | 2600 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 9.8 | 16 | 17 | 44 | 15 | 11 | 18 | 17 | 20 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | 0.21 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 6.1 | 16 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | ~0.06 | 0.17 | 0.20 | 0.04 | 0.08 | 0.16 | 0.26 | 0.12 | --- |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW5A | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 140 | 190 | 290 | 220 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 3.0 | 1.3 | 4.1 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.1 | 2.4 | 4.4 | 3.9 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.014 | <0.010 | 0.014 | 0.013 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 440 | 640 | 1000 | 1500 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.51 | 0.55 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 200 | 320 | 530 | 370 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 220 | 280 | 550 | 500 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 24 | 35 | 57 | 38 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 220 | 240 | 430 | 280 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 2100 | 3100 | 2700 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.8 | 5.2 | 9.2 | 11 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.1 | 3.1 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 7.9 | 15 | 5.9 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.39 | 0.35 | 0.07 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

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**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW6A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 150 | 270 | 270 | 250 | 160 | 220 | 310 | 300 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 3.1 | 3.8 | 1.1 | 1.6 | 7.2 | 3.0 | 1.3 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.0 | 2.7 | 3.8 | 2.9 | 1.9 | 2.8 | 4.7 | 4.0 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.014 | 0.014 | 0.017 | 0.012 | 0.011 | 0.016 | 0.018 | 0.016 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 550 | 650 | 900 | 730 | 550 | 690 | 1200 | 1000 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.1 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | 0.68 | <0.40 | <0.40 | 0.64 | 0.59 | 0.47 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.66 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 170 | 400 | 680 | 330 | 250 | 790 | 620 | 450 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 280 | 280 | 380 | 340 | 240 | 290 | 520 | 480 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 41 | 35 | 62 | 40 | 23 | 62 | 60 | 49 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | 2.1 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 230 | 170 | 220 | 150 | 170 | 240 | 290 | 200 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1900 | 1900 | 2600 | 2100 | 1700 | 2100 | 3000 | 2900 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.2 | 4.8 | 7.2 | 5.6 | 4.1 | 5.2 | 9.2 | 8.5 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 3.5 | 2.2 | <2.0 | 2.7 | 3.9 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 8.9 | 7.7 | 5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.15 | 0.75 | 1.65 | 0.27 | 0.48 | 10.00 | 1.37 | 0.41 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | 0.013 | <0.013 | 0.0 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

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**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| Sampling Date | | CCME FWAL | RDL | SW9 | | | |
|---|---|---|---|---|---|---|---|
| | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 140 | 230 | 200 | 240 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.9 | 4.2 | 5.4 | 3.5 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.012 | 0.012 | 0.011 | 0.014 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 1100 | 1400 | 2100 | 860 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.1 | 1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 170 | 230 | 420 | 270 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 570 | 670 | 1100 | 480 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 49 | 44 | 60 | 40 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 310 | 170 | 250 | 160 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 3500 | 3500 | 3500 | 2500 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.6 | 5.0 | 8.1 | 4.7 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 2.1 | 3.3 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 5.5 | <5.0 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.13 | 0.29 | 0.07 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW10 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 60 | 120 | 21 | 120 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 43 | 83 | 29 | 67 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 4.7 | 5.8 | 3.2 | 5.0 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.022 | 0.040 | <0.010 | 0.024 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 5600 | 5600 | 3300 | 4800 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | 1.0 | 1.4 | <0.40 | 1.2 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | 0.84 | 1.8 | <0.50 | 1.2 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 1400 | 1300 | 400 | 1600 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 850 | 770 | 700 | 720 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 100 | 120 | 60 | 98 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | 4.6 | 6.9 | <2.0 | 4.6 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 540 | 620 | 430 | 530 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 2100 | 2000 | 2100 | 2000 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 21 | 22 | 19 | 19 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 8.8 | 12 | <5.0 | 9.3 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | ~0.01 | 0.02 | 0.13 | ~0.011 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5; 100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW11 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | 10-Apr-19 | 12-Jun-19 | 12-Sep-19 | 2-Dec-19 | 21-22-Apr-20 | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | | | (DUP) | | | (DUP) | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 280 | 270 | 410 | 280 | 180 | 170 | 260 | 460 | 370 | 360 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | <1.0 | 1.4 | <1.0 | <1.0 | <1.0 | 1.3 | 1.3 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.6 | 1.9 | 4.8 | 2.2 | 1.6 | 1.4 | 2.5 | 4.9 | 3.0 | 3.8 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.020 | 0.014 | 0.019 | 0.017 | <0.010 | <0.010 | <0.010 | 0.028 | 0.014 | 0.013 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 450 | 460 | 1200 | 660 | 570 | 530 | 990 | 1600 | 1600 | 1600 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.2 | 1.1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | 0.58 | <0.40 | 0.55 | <0.40 | <0.40 | <0.40 | <0.40 | 0.45 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 210 | 570 | 1000 | 410 | 290 | 290 | 550 | 1000 | 570 | 580 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.71 | <0.50 | <0.50 | <0.50 | <0.50 | 0.68 | 0.59 | 0.61 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 440 | 250 | 610 | 400 | 330 | 310 | 530 | 850 | 1000 | 1100 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 37 | 22 | 50 | 29 | 24 | 23 | 35 | 56 | 46 | 47 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | 6.5 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 290 | <100 | 370 | <100 | 170 | 140 | 190 | 410 | 180 | 160 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 2000 | 1600 | 2900 | 2000 | 1500 | 1500 | 2000 | 3300 | 2800 | 2900 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.0 | 4.0 | 9.7 | 4.2 | 3.5 | 3.4 | 5.4 | 11 | 7.2 | 6.8 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.1 | 2.7 | 2.2 | <2.0 | <2.0 | <2.0 | 3.9 | 2.3 | 2.4 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | 5.9 | <5.0 | <5.0 | 7.8 | 11 | 7.5 | <5.0 | 6.7 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.13 | 0.30 | 0.69 | 0.32 | 0.17 | 0.19 | 0.80 | 1.06 | 0.17 | 0.16 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW12 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **10-Apr-19** | **12-Jun-19** | **12-Sep-19** | **2-Dec-19** | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 250 | 300 | 510 | 290 | 250 | 280 | 520 | 340 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 1.6 | 2.0 | <1.0 | <1.0 | 2.1 | 1.4 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 1.9 | 2.2 | 5.5 | 1.8 | 1.7 | 2.5 | 5.7 | 3.5 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.014 | 0.015 | 0.048 | 0.011 | 0.014 | <0.010 | 0.031 | 0.039 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 520 | 400 | 1000 | 430 | 410 | 400 | 1300 | 670 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | 1.1 | 1.2 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | 0.48 | <0.40 | 0.51 | <0.40 | <0.40 | <0.40 | 0.65 | 0.49 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 230 | 560 | 900 | 470 | 180 | 510 | 600 | 210 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.71 | <0.50 | <0.50 | <0.50 | 0.55 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 310 | 250 | 610 | 290 | 230 | 300 | 780 | 460 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 46 | 20 | 51 | 23 | 19 | 22 | 59 | 32 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 210 | <100 | 290 | <100 | 130 | 220 | 480 | 120 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <1.0 | <1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 2000 | 1800 | 3200 | 2000 | 1800 | 2100 | 3500 | 3200 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.8 | 3.3 | 9.7 | 3.8 | 3.0 | 3.7 | 10 | 6.2 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.2 | 3.5 | 2.5 | <2.0 | <2.0 | 3.5 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | <5.0 | 5.5 | <5.0 | 9.6 | 12 | 7.7 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.09 | 0.42 | 0.22 | 0.12 | 0.06 | 1.14 | 0.11 | 0.12 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW14 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | **(DUP)** | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 38 | 30 | 14 | 14 | 46 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 7.2 | 19 | 5.5 | 5.4 | 13 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 3.2 | 4.6 | 3.1 | 3.1 | 3.6 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 2300 | 3200 | 2200 | 2200 | 4000 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | 0.57 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 230 | 600 | 170 | 170 | 310 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 410 | 600 | 650 | 650 | 740 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 19 | 92 | 28 | 27 | 7.0 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | 2.8 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 350 | 590 | 650 | 630 | 650 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1500 | 1900 | 2700 | 2800 | 2600 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 11 | 18 | 14 | 13 | 20 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 14 | 22 | <5.0 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.28 | 0.10 | 0.12 | 0.08 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| Sampling Date | | CCME FWAL | RDL | SW19 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 21-22-Apr-20 | 17-18-Jun-20 | 17-18-Jun-20 | 24-25-Sep-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | (DUP) | | (DUP) | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 180 | 200 | 370 | 370 | 270 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 1.0 | 1.1 | <1.0 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 1.8 | 2.6 | 2.4 | 6.1 | 6.5 | 3.9 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | 0.011 | 0.026 | 0.025 | 0.016 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 420 | 430 | 390 | 1100 | 1100 | 730 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | 0.41 | 0.41 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 240 | 390 | 400 | 780 | 800 | 530 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | 1.6 | <0.50 | 0.62 | 0.64 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 190 | 230 | 230 | 590 | 590 | 440 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 21 | 27 | 28 | 54 | 54 | 40 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 190 | 190 | 180 | 330 | 330 | 220 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 1900 | 2000 | 3100 | 3100 | 2600 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.2 | 4.0 | 3.9 | 11 | 11 | 7.3 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | 2.9 | 3.3 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 13 | 15 | 9.9 | 7.0 | 6.4 | 5.2 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.09 | 0.40 | 0.40 | 0.27 | 0.25 | 0.10 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| Sampling Date | | CCME FWAL | RDL | SW26 | | | |
|---|---|---|---|---|---|---|---|
| | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 140 | 190 | 310 | 250 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 2.5 | <1.0 | 3.9 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.0 | 2.7 | 4.6 | 3.6 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.013 | 0.020 | 0.017 | 0.021 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 430 | 590 | 1000 | 930 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | 0.51 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 200 | 350 | 590 | 180 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 220 | 280 | 500 | 470 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 23 | 30 | 47 | 22 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 190 | 270 | 280 | 150 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 2200 | 3000 | 2600 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.7 | 5.0 | 8.8 | 8.5 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.4 | 2.5 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 8.1 | 45 | 5.2 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.09 | 0.41 | 0.36 | 0.06 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| Sampling Date | | CCME FWAL | RDL | SW28 | |
|---|---|---|---|---|---|
| | | | | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 530 | 340 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 4.9 | 3.1 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 5.5 | 2.3 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.025 | 0.010 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 1300 | 2200 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | 0.77 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 1100 | 630 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | 0.77 | 0.61 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 770 | 1500 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 77 | 61 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 530 | 190 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 3800 | 3200 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 14 | 7.2 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | 5.3 | 3.3 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <1.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 6.7 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.16 | 0.25 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| Sampling Date | | CCME FWAL | RDL | SW29 | | | |
|---|---|---|---|---|---|---|---|
| | | | | 21-22-Apr-20 | 17-18-Jun-20 | 24-25-Sep-20 | 15-16-Dec-20 |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 190 | 360 | 270 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 1.8 | 2.3 | 5.3 | 3.6 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | 0.021 | 0.020 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 340 | 420 | 890 | 670 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 240 | 380 | 790 | 560 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.61 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 190 | 230 | 530 | 420 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 20 | 25 | 50 | 40 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 250 | 170 | 250 | 190 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 1800 | 2900 | 2600 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.3 | 3.8 | 9.1 | 7.5 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 4.0 | 2.3 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | 7.8 | 5.2 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.38 | 0.24 | 0.10 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW30 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 130 | 220 | 330 | 220 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | 2.8 | 7.2 | 8.3 | 2.6 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 1.9 | 3.3 | 4.7 | 3.0 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.049 | 0.017 | 0.036 | 0.027 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 400 | 810 | 1200 | 800 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | 0.61 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 160 | 420 | 800 | 280 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | 0.53 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 220 | 330 | 540 | 430 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 26 | 39 | 61 | 30 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 260 | 230 | 340 | 390 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 2000 | 2700 | 3300 | 3000 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 3.4 | 5.7 | 9.2 | 6.8 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 3.0 | <2.0 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | 7.2 | 6.1 | 5.5 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.09 | 0.52 | 0.36 | 0.27 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW31 | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | **(DUP)]** | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 150 | 210 | 210 | 500 | 340 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 2.1 | 2.2 | 2.0 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 1.6 | 1.9 | 2.0 | 4.8 | 3.5 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | 0.016 | 0.012 | 0.013 | 0.036 | 0.026 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 300 | 460 | 430 | 840 | 660 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 | 0.59 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 120 | 230 | 240 | 570 | 990 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | 0.75 | 0.53 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 190 | 240 | 250 | 600 | 440 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 11 | 13 | 13 | 27 | 25 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 240 | 270 | 290 | 430 | 250 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1900 | 2600 | 2600 | 3600 | 3000 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 2.7 | 3.5 | 3.9 | 8.7 | 6.8 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | <2.0 | 2.5 | 4.9 | 2.6 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | 0.10 | 0.21 | 0.21 | 0.24 | 0.15 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | <5.0 | 9.4 | 6.0 | 6.3 | 5.8 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.28 | 0.29 | 0.22 | --- |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | 0.0 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH $\geq$ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-4: Dissolved Metals**

| | | CCME FWAL | RDL | SW32 | | | |
|---|---|---|---|---|---|---|---|
| **Sampling Date** | | | | **21-22-Apr-20** | **17-18-Jun-20** | **24-25-Sep-20** | **15-16-Dec-20** |
| **Metals** | **Units** | | | | | | |
| Dissolved Aluminum (Al) | ug/L | Narrative [1] | 5.0 | 140 | 130 | 280 | 290 |
| Dissolved Antimony (Sb) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Arsenic (As) | ug/L | 5 | 1.0 | <1.0 | 2.9 | 1.4 | <1.0 |
| Dissolved Barium (Ba) | ug/L | ns | 1.0 | 2.9 | 5.2 | 6.7 | 4.7 |
| Dissolved Beryllium (Be) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Bismuth (Bi) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Boron (B) | ug/L | 1,500 | 50 | <50 | <50 | <50 | <50 |
| Dissolved Cadmium (Cd) | ug/L | Narrative [2] | 0.010 | <0.010 | <0.010 | 0.015 | 0.019 |
| Dissolved Calcium (Ca) | ug/L | ns | 100 | 1000 | 3500 | 2000 | 1600 |
| Dissolved Chromium (Cr) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Cobalt (Co) | ug/L | ns | 0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Dissolved Copper (Cu) | ug/L | Narrative [2] | 0.50 | <0.50 | 0.70 | <0.50 | <0.50 |
| Dissolved Iron (Fe) | ug/L | 300 | 50 | 180 | 310 | 510 | 440 |
| Dissolved Lead (Pb) | ug/L | Narrative [2] | 0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Magnesium (Mg) | ug/L | ns | 100 | 480 | 1600 | 900 | 800 |
| Dissolved Manganese (Mn) | ug/L | ns | 2.0 | 34 | 19 | 100 | 63 |
| Dissolved Molybdenum (Mo) | ug/L | 73 | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Nickel (Ni) | ug/L | Narrative [2] | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Phosphorus (P) | ug/L | ns | 100 | <100 | <100 | <100 | <100 |
| Dissolved Potassium (K) | ug/L | ns | 100 | 180 | 280 | 300 | 260 |
| Dissolved Selenium (Se) | ug/L | 1 | 1.0 | <0.50 | <0.50 | <0.50 | <0.50 |
| Dissolved Silver (Ag) | ug/L | 0.25 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Sodium (Na) | ug/L | ns | 100 | 1600 | 2100 | 3000 | 2900 |
| Dissolved Strontium (Sr) | ug/L | ns | 2.0 | 4.5 | 7.6 | 9.8 | 9.1 |
| Dissolved Thallium (Tl) | ug/L | 0.8 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Tin (Sn) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Titanium (Ti) | ug/L | ns | 2.0 | <2.0 | 2.5 | 3.0 | 2.4 |
| Dissolved Tungsten (W) | ug/L | ns | 1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dissolved Uranium (U) | ug/L | 15 | 0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Dissolved Vanadium (V) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zirconium (Zr) | ug/L | ns | 2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Dissolved Zinc (Zn) | ug/L | 30 | 5.0 | 8.7 | <5.0 | <5.0 | <5.0 |
| Methylmercury (Net $CH_3Hg$) | ng/L | 4 | 0.08 | 0.08 | 0.35 | 0.40 | 0.12 |
| Dissolved Mercury (Hg) | ug/L | 0.026 | 0.013 | <0.013 | <0.013 | <0.013 | <0.013 |

**Above or outside the Canadian Council of Ministers of the Environment, Water Quality Guidelinesfor the Protection of Aquatic Life, Freshwater (CCME FWAL)**

**Notes:**

ug/L - microgram per litre
RDL - Reportable Detection Limit
ns - no standard listed
NC - Not Calculated
ng/L - nanogram per litre

**Narrative:**

[1] Aluminum guideline variable: 5 ug/L if pH < 6.5
100 ug/L if pH ≥ 6.5

[2] Cadmium, copper, lead, nickel guidelines are variable based on reported hardness (mg/L $CaCO_3$) concentrations for each sample

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-2 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.160 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.220 |
| Hardness (CaCO3) | mg/L | | | 3.3 |
| Ion Balance (% Difference) | % | | | 15.8 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.0 |
| Colour | TCU | | | 270 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.65 |
| Reactive Silica (SiO2) | mg/L | | | 1.7 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | 2.3 |
| Turbidity | NTU | | | 0.95 |
| Conductivity | uS/cm | | | 25 |

**Notes**: CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference); MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference); (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-2 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 350 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 1.9 |
| Total Barium (Ba) | ug/L | | | 2.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.014 |
| Total Calcium (Ca) | ug/L | | | 780 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 880 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.79 |
| Total Magnesium (Mg) | ug/L | | | 320 |
| Total Manganese (Mn) | ug/L | | | 29 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 180 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 4.5 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.3 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-3 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 8.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.170 |
| Hardness (CaCO3) | mg/L | | | 2.8 |
| Ion Balance (% Difference) | % | | | 25.9 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.6 |
| Colour | TCU | | | 220 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 16 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.07 |
| Reactive Silica (SiO2) | mg/L | | | 0.85 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.83 |
| Conductivity | uS/cm | | | 18 |

**Notes**: CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-3 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 320 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 1.2 |
| Total Barium (Ba) | ug/L | | | 2.1 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | <0.010 |
| Total Calcium (Ca) | ug/L | | | 620 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 780 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.52 |
| Total Magnesium (Mg) | ug/L | | | 310 |
| Total Manganese (Mn) | ug/L | | | 28 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 170 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 1800 |
| Total Strontium (Sr) | ug/L | | | 4.6 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 3.3 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 6.3 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83[\log(\text{hardness})]-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-7 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.220 |
| Hardness (CaCO3) | mg/L | | | 2.9 |
| Ion Balance (% Difference) | % | | | 33.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.8 |
| Colour | TCU | | | 230 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 20 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.61 |
| Reactive Silica (SiO2) | mg/L | | | 3.2 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.0 |
| Conductivity | uS/cm | | | 28 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-7 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 440 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.013 |
| Total Calcium (Ca) | ug/L | | | 540 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.44 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 730 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.86 |
| Total Magnesium (Mg) | ug/L | | | 370 |
| Total Manganese (Mn) | ug/L | | | 23 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 190 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2300 |
| Total Strontium (Sr) | ug/L | | | 6.4 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.3 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-8 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.220 |
| Hardness (CaCO3) | mg/L | | | 3.9 |
| Ion Balance (% Difference) | % | | | 33.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.8 |
| Colour | TCU | | | 220 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 16 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.56 |
| Reactive Silica (SiO2) | mg/L | | | 1.7 |
| Total Suspended Solids | mg/L | | | 7.2 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.83 |
| Conductivity | uS/cm | | | 25 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-8 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 440 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 2.1 |
| Total Barium (Ba) | ug/L | | | 3.8 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.015 |
| Total Calcium (Ca) | ug/L | | | 900 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.77 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1000 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.52 |
| Total Magnesium (Mg) | ug/L | | | 390 |
| Total Manganese (Mn) | ug/L | | | 29 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | 2.1 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 220 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2200 |
| Total Strontium (Sr) | ug/L | | | 6.9 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.5 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 13 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-9 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 9.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.220 |
| Hardness (CaCO3) | mg/L | | | 3.6 |
| Ion Balance (% Difference) | % | | | 37.5 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.6 |
| Colour | TCU | | | 120 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 9.5 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.59 |
| Reactive Silica (SiO2) | mg/L | | | 0.68 |
| Total Suspended Solids | mg/L | | | 2.8 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.6 |
| Conductivity | uS/cm | | | 20 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-9 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 360 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 17 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 700 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.49 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 930 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.52 |
| Total Magnesium (Mg) | ug/L | | | 440 |
| Total Manganese (Mn) | ug/L | | | 63 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 530 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 |
| Total Strontium (Sr) | ug/L | | | 8.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 3.6 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 5.5 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-10 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.230 |
| Hardness (CaCO3) | mg/L | | | 3.1 |
| Ion Balance (% Difference) | % | | | 35.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.8 |
| Colour | TCU | | | 270 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | 4.67 |
| Reactive Silica (SiO2) | mg/L | | | 3.3 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.7 |
| Conductivity | uS/cm | | | 27 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-10 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 500 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.022 |
| Total Calcium (Ca) | ug/L | | | 600 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 980 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.88 |
| Total Magnesium (Mg) | ug/L | | | 390 |
| Total Manganese (Mn) | ug/L | | | 28 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 230 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2300 |
| Total Strontium (Sr) | ug/L | | | 7.2 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 7.6 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 5.1 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-11 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | | (DUP 4) |
| Anion Sum | me/L | | | 0.100 | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | 10 | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Cation Sum | me/L | | | 0.210 | 0.200 |
| Hardness (CaCO3) | mg/L | | | 3.0 | 2.9 |
| Ion Balance (% Difference) | % | | | 35.5 | 29.0 |
| Langelier Index (@ 20C) | N/A | | | NC | NC |
| Langelier Index (@ 4C) | N/A | | | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC | NC |
| Saturation pH (@ 4C) | N/A | | | NC | NC |
| **Inorganics** | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.5 | 3.7 |
| Colour | TCU | | | 220 | 220 |
| Nitrate + Nitrite | mg/L | | | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 16 | 15 |
| Orthophosphate (P) | mg/L | | | 0.010 | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.09 | 4.97 |
| Reactive Silica (SiO2) | mg/L | | | 2.3 | 2.3 |
| Total Suspended Solids | mg/L | | | 2.8 | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 | <2.0 |
| Turbidity | NTU | | | 1.2 | 1.6 |
| Conductivity | uS/cm | | | 24 | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-11 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** | **9-Jun-16** |
| **Metals** | **Units** | | | | (DUP 4) |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 450 | 430 |
| Total Antimony (Sb) | ug/L | | | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.0 | 4.0 |
| Total Beryllium (Be) | ug/L | | | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.018 | 0.012 |
| Total Calcium (Ca) | ug/L | | | 580 | 570 |
| Total Chromium (Cr) | ug/L | | | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 900 | 770 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.74 | 0.63 |
| Total Magnesium (Mg) | ug/L | | | 370 | 360 |
| Total Manganese (Mn) | ug/L | | | 36 | 35 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 | <100 |
| Total Potassium (K) | ug/L | | | 300 | 280 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 | 2300 |
| Total Strontium (Sr) | ug/L | | | 7.2 | 7.1 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.3 | 5.7 |
| Total Uranium (U) | ug/L | **15** | | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-12 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.250 |
| Hardness (CaCO3) | mg/L | | | 3.5 |
| Ion Balance (% Difference) | % | | | 38.9 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.072 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.5 |
| Colour | TCU | | | 290 |
| Nitrate + Nitrite | mg/L | | | 0.072 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | 0.062 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.012 |
| pH | pH | **6.5-9** | **6-9.5** | 4.60 |
| Reactive Silica (SiO2) | mg/L | | | 3.9 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.73 |
| Conductivity | uS/cm | | | 28 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-12 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 510 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.0 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.020 |
| Total Calcium (Ca) | ug/L | | | 650 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1100 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.98 |
| Total Magnesium (Mg) | ug/L | | | 470 |
| Total Manganese (Mn) | ug/L | | | 20 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 220 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2500 |
| Total Strontium (Sr) | ug/L | | | 8.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 7.3 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-13 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.0900 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 3.0 |
| Ion Balance (% Difference) | % | | | 40.0 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.3 |
| Colour | TCU | | | 190 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 12 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.00 |
| Reactive Silica (SiO2) | mg/L | | | 2.4 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.1 |
| Conductivity | uS/cm | | | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-13 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 420 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 580 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.53 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 830 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.70 |
| Total Magnesium (Mg) | ug/L | | | 380 |
| Total Manganese (Mn) | ug/L | | | 54 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 280 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2500 |
| Total Strontium (Sr) | ug/L | | | 7.2 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 5.8 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-14 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 2.5 |
| Ion Balance (% Difference) | % | | | 31.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.7 |
| Colour | TCU | | | 130 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 9.2 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.19 |
| Reactive Silica (SiO2) | mg/L | | | 3.7 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.3 |
| Conductivity | uS/cm | | | 21 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-14 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 340 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.014 |
| Total Calcium (Ca) | ug/L | | | 490 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 1.2 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1200 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 300 |
| Total Manganese (Mn) | ug/L | | | 100 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 150 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 |
| Total Strontium (Sr) | ug/L | | | 6.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 5.4 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-15 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.200 |
| Hardness (CaCO3) | mg/L | | | 3.2 |
| Ion Balance (% Difference) | % | | | 33.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.7 |
| Colour | TCU | | | 140 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 13 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.22 |
| Reactive Silica (SiO2) | mg/L | | | 4.2 |
| Total Suspended Solids | mg/L | | | 1.8 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.75 |
| Conductivity | uS/cm | | | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-15 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 470 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.013 |
| Total Calcium (Ca) | ug/L | | | 720 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.66 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 700 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 340 |
| Total Manganese (Mn) | ug/L | | | 41 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 160 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2300 |
| Total Strontium (Sr) | ug/L | | | 7.6 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.2 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-16 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.190 |
| Hardness (CaCO3) | mg/L | | | 3.4 |
| Ion Balance (% Difference) | % | | | 26.7 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 |
| Colour | TCU | | | 190 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 17 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.02 |
| Reactive Silica (SiO2) | mg/L | | | 3.5 |
| Total Suspended Solids | mg/L | | | 3.6 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.45 |
| Conductivity | uS/cm | | | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE 2. G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-16 |
|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 460 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 5.1 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.018 |
| Total Calcium (Ca) | ug/L | | | 760 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.49 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 520 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 370 |
| Total Manganese (Mn) | ug/L | | | 31 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 160 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 9.3 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.2 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-17 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** | **9-Jun-16** |
| **Calculated Parameters** | **Units** | | | | (DUP 3) |
| Anion Sum | me/L | | | 0.100 | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | 11 | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Cation Sum | me/L | | | 0.210 | 0.200 |
| Hardness (CaCO3) | mg/L | | | 3.5 | 3.3 |
| Ion Balance (% Difference) | % | | | 35.5 | 33.3 |
| Langelier Index (@ 20C) | N/A | | | NC | NC |
| Langelier Index (@ 4C) | N/A | | | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC | NC |
| Saturation pH (@ 4C) | N/A | | | NC | NC |
| **Inorganics** | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.7 | 3.5 |
| Colour | TCU | | | 200 | 190 |
| Nitrate + Nitrite | mg/L | | | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 16 | 16 |
| Orthophosphate (P) | mg/L | | | <0.010 | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.39 | 5.83 |
| Reactive Silica (SiO2) | mg/L | | | 3.2 | 3.2 |
| Total Suspended Solids | mg/L | | | 6.4 | 2.6 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 | <2.0 |
| Turbidity | NTU | | | 0.92 | 1.2 |
| Conductivity | uS/cm | | | 21 | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-17 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **9-Jun-16** | **9-Jun-16** |
| **Metals** | **Units** | | | | (DUP 3) |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 400 | 390 |
| Total Antimony (Sb) | ug/L | | | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.5 | 4.5 |
| Total Beryllium (Be) | ug/L | | | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.014 | 0.012 |
| Total Calcium (Ca) | ug/L | | | 790 | 760 |
| Total Chromium (Cr) | ug/L | | | <1.0 | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.63 | 0.58 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 930 | 850 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.53 | 0.59 |
| Total Magnesium (Mg) | ug/L | | | 360 | 350 |
| Total Manganese (Mn) | ug/L | | | 46 | 42 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 | <100 |
| Total Potassium (K) | ug/L | | | 180 | 210 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | 2200 | 2300 |
| Total Strontium (Sr) | ug/L | | | 8.2 | 7.7 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.8 | 6.6 |
| Total Uranium (U) | ug/L | **15** | | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-23 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 2.7 |
| Ion Balance (% Difference) | % | | | 31.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.0 |
| Colour | TCU | | | 230 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.73 |
| Reactive Silica (SiO2) | mg/L | | | 4.6 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.94 |
| Conductivity | uS/cm | | | 28 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-23 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 520 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.018 |
| Total Calcium (Ca) | ug/L | | | 490 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 570 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.77 |
| Total Magnesium (Mg) | ug/L | | | 350 |
| Total Manganese (Mn) | ug/L | | | 30 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 330 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 |
| Total Strontium (Sr) | ug/L | | | 5.1 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 9.0 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-24 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.120 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 3.2 |
| Ion Balance (% Difference) | % | | | 27.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.062 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 |
| Colour | TCU | | | 230 |
| Nitrate + Nitrite | mg/L | | | 0.062 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.92 |
| Reactive Silica (SiO2) | mg/L | | | 3.9 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.5 |
| Conductivity | uS/cm | | | 24 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-24 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 470 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.6 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.020 |
| Total Calcium (Ca) | ug/L | | | 660 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 690 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.73 |
| Total Magnesium (Mg) | ug/L | | | 380 |
| Total Manganese (Mn) | ug/L | | | 58 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 180 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 |
| Total Strontium (Sr) | ug/L | | | 6.5 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 7.1 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-25 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.230 |
| Hardness (CaCO3) | mg/L | | | 2.6 |
| Ion Balance (% Difference) | % | | | 35.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.0 |
| Colour | TCU | | | 230 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 20 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.69 |
| Reactive Silica (SiO2) | mg/L | | | 4.3 |
| Total Suspended Solids | mg/L | | | 2.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.3 |
| Conductivity | uS/cm | | | 26 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-25 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 740 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.6 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.022 |
| Total Calcium (Ca) | ug/L | | | 460 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 750 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.91 |
| Total Magnesium (Mg) | ug/L | | | 350 |
| Total Manganese (Mn) | ug/L | | | 31 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 390 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2700 |
| Total Strontium (Sr) | ug/L | | | 5.6 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 12 |
| Total Uranium (U) | ug/L | **15** | | 0.11 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-26 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.190 |
| Hardness (CaCO3) | mg/L | | | 2.5 |
| Ion Balance (% Difference) | % | | | 26.7 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.1 |
| Colour | TCU | | | 190 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 16 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.97 |
| Reactive Silica (SiO2) | mg/L | | | 2.6 |
| Total Suspended Solids | mg/L | | | 2.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.1 |
| Conductivity | uS/cm | | | 27 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-26 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 390 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.0 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.020 |
| Total Calcium (Ca) | ug/L | | | 460 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 730 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.64 |
| Total Magnesium (Mg) | ug/L | | | 330 |
| Total Manganese (Mn) | ug/L | | | 48 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 170 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2200 |
| Total Strontium (Sr) | ug/L | | | 4.7 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.1 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '-' denotes not analyzed.

**TABLE G.1-5. General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-27 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.120 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 2.6 |
| Ion Balance (% Difference) | % | | | 27.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.1 |
| Colour | TCU | | | 280 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 20 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.69 |
| Reactive Silica (SiO2) | mg/L | | | 2.9 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.85 |
| Conductivity | uS/cm | | | 28 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-27 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[1] | | 350 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[2] | | 0.019 |
| Total Calcium (Ca) | ug/L | | | 450 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[3] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 710 |
| Total Lead (Pb) | ug/L | **1 - 7**[4] | **400** | 0.85 |
| Total Magnesium (Mg) | ug/L | | | 360 |
| Total Manganese (Mn) | ug/L | | | 24 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[5] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 210 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2500 |
| Total Strontium (Sr) | ug/L | | | 5.8 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.5 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-28 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 8.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.170 |
| Hardness (CaCO3) | mg/L | | | 2.0 |
| Ion Balance (% Difference) | % | | | 21.4 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 |
| Colour | TCU | | | 150 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 11 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.23 |
| Reactive Silica (SiO2) | mg/L | | | <0.50 |
| Total Suspended Solids | mg/L | | | 3.2 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.6 |
| Conductivity | uS/cm | | | 19 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-28 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 200 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 1.5 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.018 |
| Total Calcium (Ca) | ug/L | | | 350 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 640 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 280 |
| Total Manganese (Mn) | ug/L | | | 31 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 320 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2000 |
| Total Strontium (Sr) | ug/L | | | 3.9 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.8 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-29 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 8.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.160 |
| Hardness (CaCO3) | mg/L | | | 2.8 |
| Ion Balance (% Difference) | % | | | 23.1 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.6 |
| Colour | TCU | | | 100 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 6.7 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.62 |
| Reactive Silica (SiO2) | mg/L | | | 0.97 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.63 |
| Conductivity | uS/cm | | | 18 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-29 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 220 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 2.6 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.019 |
| Total Calcium (Ca) | ug/L | | | 650 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 300 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 290 |
| Total Manganese (Mn) | ug/L | | | 41 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 180 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2000 |
| Total Strontium (Sr) | ug/L | | | 5.3 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 2.4 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)"**

| | | CCME FAL | MMER | WC-30 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 9.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.190 |
| Hardness (CaCO3) | mg/L | | | 3.3 |
| Ion Balance (% Difference) | % | | | 31.0 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.056 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.3 |
| Colour | TCU | | | 140 |
| Nitrate + Nitrite | mg/L | | | 0.056 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 9.8 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.31 |
| Reactive Silica (SiO2) | mg/L | | | 1.1 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.3 |
| Conductivity | uS/cm | | | 19 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5. Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-30 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 300 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.1 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 790 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 530 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 330 |
| Total Manganese (Mn) | ug/L | | | 60 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 180 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 4.6 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.6 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-31 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.0800 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.200 |
| Hardness (CaCO3) | mg/L | | | 3.5 |
| Ion Balance (% Difference) | % | | | 42.9 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 2.9 |
| Colour | TCU | | | 110 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 10 |
| Orthophosphate (P) | mg/L | | | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | 5.27 |
| Reactive Silica (SiO2) | mg/L | | | 3.0 |
| Total Suspended Solids | mg/L | | | 6.6 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 1.9 |
| Conductivity | uS/cm | | | 20 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-31 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 420 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 6.6 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.030 |
| Total Calcium (Ca) | ug/L | | | 720 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 340 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.53 |
| Total Magnesium (Mg) | ug/L | | | 400 |
| Total Manganese (Mn) | ug/L | | | 100 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 120 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2600 |
| Total Strontium (Sr) | ug/L | | | 6.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.0 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '-' denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-41 |
|---|---|---|---|---|
| **Sampling Date** | | | | **23-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.170 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 19 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 2.0 |
| Ion Balance (% Difference) | % | | | 10.5 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.58 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.5 |
| Colour | TCU | | | 89 |
| Nitrate + Nitrite | mg/L | | | 0.58 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | 0.057 |
| Total Organic Carbon (C) | mg/L | | | 6.4 |
| Orthophosphate (P) | mg/L | | | 0.013 |
| pH | pH | **6.5-9** | **6-9.5** | 4.74 |
| Reactive Silica (SiO2) | mg/L | | | 7.8 |
| Total Suspended Solids | mg/L | | | 7.2 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 3.4 |
| Conductivity | uS/cm | | | 37 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-41 |
|---|---|---|---|---|
| **Sampling Date** | | | | |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 330 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.1 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.017 |
| Total Calcium (Ca) | ug/L | | | 380 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 130 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.55 |
| Total Magnesium (Mg) | ug/L | | | 250 |
| Total Manganese (Mn) | ug/L | | | 5.3 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 370 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 3200 |
| Total Strontium (Sr) | ug/L | | | 4.3 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 5.9 |
| Total Uranium (U) | ug/L | **15** | | 0.72 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-42 |
|---|---|---|---|---|
| **Sampling Date** | | | | |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 12 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.190 |
| Hardness (CaCO3) | mg/L | | | 1.9 |
| Ion Balance (% Difference) | % | | | 31.0 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.058 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.5 |
| Colour | TCU | | | 140 |
| Nitrate + Nitrite | mg/L | | | 0.058 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | 0.19 |
| Total Organic Carbon (C) | mg/L | | | 8.5 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.79 |
| Reactive Silica (SiO2) | mg/L | | | 4.6 |
| Total Suspended Solids | mg/L | | | <2.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.52 |
| Conductivity | uS/cm | | | 24 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-42 |
|---|---|---|---|---|
| **Sampling Date** | | | | |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 350 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.3 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.015 |
| Total Calcium (Ca) | ug/L | | | 350 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 360 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 250 |
| Total Manganese (Mn) | ug/L | | | 36 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 190 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2700 |
| Total Strontium (Sr) | ug/L | | | 4.1 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.7 |
| Total Uranium (U) | ug/L | **15** | | 0.21 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-43 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | | (DUP 1) |
| Anion Sum | me/L | | | 0.120 | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | 12 | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Cation Sum | me/L | | | 0.300 | 0.270 |
| Hardness (CaCO3) | mg/L | | | 7.0 | 6.3 |
| Ion Balance (% Difference) | % | | | 42.9 | 42.1 |
| Langelier Index (@ 20C) | N/A | | | NC | NC |
| Langelier Index (@ 4C) | N/A | | | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC | NC |
| Saturation pH (@ 4C) | N/A | | | NC | NC |
| **Inorganics** | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 4.1 | 3.9 |
| Colour | TCU | | | 280 | 280 |
| Nitrate + Nitrite | mg/L | | | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 | 19 |
| Orthophosphate (P) | mg/L | | | 0.011 | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | 5.13 | 5.64 |
| Reactive Silica (SiO2) | mg/L | | | 1.2 | 1.2 |
| Total Suspended Solids | mg/L | | | 7.8 | 4.4 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 | <2.0 |
| Turbidity | NTU | | | 11 | 13 |
| Conductivity | uS/cm | | | 22 | 24 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-43 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** | **8-Jun-16** |
| **Metals** | **Units** | | | | (DUP 1) |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 1000 | 820 |
| Total Antimony (Sb) | ug/L | | | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 3.8 | 3.0 |
| Total Barium (Ba) | ug/L | | | 10 | 9.0 |
| Total Beryllium (Be) | ug/L | | | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 | 0.014 |
| Total Calcium (Ca) | ug/L | | | 1400 | 1300 |
| Total Chromium (Cr) | ug/L | | | 1.4 | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.69 | 0.61 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | 2.3 | 2.1 |
| Total Iron (Fe) | ug/L | **300** | | 1600 | 1300 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 1.8 | 1.6 |
| Total Magnesium (Mg) | ug/L | | | 870 | 750 |
| Total Manganese (Mn) | ug/L | | | 83 | 75 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 | <100 |
| Total Potassium (K) | ug/L | | | 600 | 460 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | 1900 | 2000 |
| Total Strontium (Sr) | ug/L | | | 7.5 | 7.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | 24 | 19 |
| Total Uranium (U) | ug/L | **15** | | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 6.0 | 5.5 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-44 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 6.0 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.130 |
| Hardness (CaCO3) | mg/L | | | 1.9 |
| Ion Balance (% Difference) | % | | | 13.0 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.7 |
| Colour | TCU | | | 210 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 15 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 4.97 |
| Reactive Silica (SiO2) | mg/L | | | <0.50 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.61 |
| Conductivity | uS/cm | | | 26 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-44 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 170 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 1.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 370 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 510 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 230 |
| Total Manganese (Mn) | ug/L | | | 31 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 100 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 1400 |
| Total Strontium (Sr) | ug/L | | | 2.5 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 3.7 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-45 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 10 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.210 |
| Hardness (CaCO3) | mg/L | | | 3.6 |
| Ion Balance (% Difference) | % | | | 31.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.7 |
| Colour | TCU | | | 200 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 14 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.21 |
| Reactive Silica (SiO2) | mg/L | | | 1.5 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.72 |
| Conductivity | uS/cm | | | 20 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-45 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 310 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 30 |
| Total Barium (Ba) | ug/L | | | 3.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.019 |
| Total Calcium (Ca) | ug/L | | | 880 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.42 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 920 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.61 |
| Total Magnesium (Mg) | ug/L | | | 350 |
| Total Manganese (Mn) | ug/L | | | 61 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | 5.7 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 190 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 5.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 4.6 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-46 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.240 |
| Hardness (CaCO3) | mg/L | | | 4.5 |
| Ion Balance (% Difference) | % | | | 37.1 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.065 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 |
| Colour | TCU | | | 190 |
| Nitrate + Nitrite | mg/L | | | 0.065 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 12 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.59 |
| Reactive Silica (SiO2) | mg/L | | | 2.0 |
| Total Suspended Solids | mg/L | | | 2.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.8 |
| Conductivity | uS/cm | | | 22 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-46 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 430 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 4.4 |
| Total Barium (Ba) | ug/L | | | 5.1 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 1100 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 720 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.68 |
| Total Magnesium (Mg) | ug/L | | | 440 |
| Total Manganese (Mn) | ug/L | | | 47 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 280 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2500 |
| Total Strontium (Sr) | ug/L | | | 6.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 12 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry**

| | | CCME FAL | MMER | SW-47 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 14 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.350 |
| Hardness (CaCO3) | mg/L | | | 7.7 |
| Ion Balance (% Difference) | % | | | 52.2 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | 0.17 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.6 |
| Colour | TCU | | | 240 |
| Nitrate + Nitrite | mg/L | | | 0.17 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 19 |
| Orthophosphate (P) | mg/L | | | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | 5.43 |
| Reactive Silica (SiO2) | mg/L | | | 2.6 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.99 |
| Conductivity | uS/cm | | | 25 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-47 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 810 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | 1.9 |
| Total Barium (Ba) | ug/L | | | 9.3 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.030 |
| Total Calcium (Ca) | ug/L | | | 1800 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.89 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1000 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 1.3 |
| Total Magnesium (Mg) | ug/L | | | 760 |
| Total Manganese (Mn) | ug/L | | | 140 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 260 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 3300 |
| Total Strontium (Sr) | ug/L | | | 10 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 15 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 5.6 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-19 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.100 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 11 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.230 |
| Hardness (CaCO3) | mg/L | | | 2.8 |
| Ion Balance (% Difference) | % | | | 39.4 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.5 |
| Colour | TCU | | | 130 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 13 |
| Orthophosphate (P) | mg/L | | | 0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.35 |
| Reactive Silica (SiO2) | mg/L | | | 2.0 |
| Total Suspended Solids | mg/L | | | 2.4 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.1 |
| Conductivity | uS/cm | | | 19 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-19 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 390 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.6 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.019 |
| Total Calcium (Ca) | ug/L | | | 560 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 2.3 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1900 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 350 |
| Total Manganese (Mn) | ug/L | | | 280 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 260 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 5.5 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 7.7 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '-' denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-20 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | | (DUP 2) |
| Anion Sum | me/L | | | 0.110 | 0.120 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Calculated TDS | mg/L | | | 14 | 14 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 | <1.0 |
| Cation Sum | me/L | | | 0.250 | 0.250 |
| Hardness (CaCO3) | mg/L | | | 3.0 | 3.1 |
| Ion Balance (% Difference) | % | | | 38.9 | 35.1 |
| Langelier Index (@ 20C) | N/A | | | NC | NC |
| Langelier Index (@ 4C) | N/A | | | NC | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC | NC |
| Saturation pH (@ 4C) | N/A | | | NC | NC |
| **Inorganics** | | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 | 4.1 |
| Colour | TCU | | | 250 | 230 |
| Nitrate + Nitrite | mg/L | | | <0.050 | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 17 | 18 |
| Orthophosphate (P) | mg/L | | | 0.011 | 0.012 |
| pH | pH | **6.5-9** | **6-9.5** | 4.90 | 4.94 |
| Reactive Silica (SiO2) | mg/L | | | 4.7 | 4.7 |
| Total Suspended Solids | mg/L | | | 1.0 | 2.2 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 | <2.0 |
| Turbidity | NTU | | | 1.5 | 2.5 |
| Conductivity | uS/cm | | | 25 | 26 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-20 | |
|---|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** | **8-Jun-16** |
| **Metals** | **Units** | | | | (DUP 2) |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 510 | 520 |
| Total Antimony (Sb) | ug/L | | | <1.0 | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.1 | 3.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.018 | 0.020 |
| Total Calcium (Ca) | ug/L | | | 560 | 610 |
| Total Chromium (Cr) | ug/L | | | 3.3 | <1.0 |
| Total Cobalt (Co) | ug/L | | | 0.81 | 0.77 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 1800 | 1700 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | 0.80 | 0.74 |
| Total Magnesium (Mg) | ug/L | | | 390 | 390 |
| Total Manganese (Mn) | ug/L | | | 120 | 110 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 | <100 |
| Total Potassium (K) | ug/L | | | 170 | 190 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 | <0.10 |
| Total Sodium (Na) | ug/L | | | 2400 | 2500 |
| Total Strontium (Sr) | ug/L | | | 5.5 | 5.8 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 | <2.0 |
| Total Titanium (Ti) | ug/L | | | 9.2 | 7.0 |
| Total Uranium (U) | ug/L | **15** | | <0.10 | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 5.2 | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465}$ * 0.2 for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-21 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.110 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 14 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.290 |
| Hardness (CaCO3) | mg/L | | | 3.1 |
| Ion Balance (% Difference) | % | | | 45.0 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.9 |
| Colour | TCU | | | 210 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 18 |
| Orthophosphate (P) | mg/L | | | 0.011 |
| pH | pH | **6.5-9** | **6-9.5** | 5.05 |
| Reactive Silica (SiO2) | mg/L | | | 3.3 |
| Total Suspended Solids | mg/L | | | 3.6 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 2.4 |
| Conductivity | uS/cm | | | 21 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-21 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 500 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.4 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.019 |
| Total Calcium (Ca) | ug/L | | | 510 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 2.2 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 3500 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 440 |
| Total Manganese (Mn) | ug/L | | | 230 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 170 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2100 |
| Total Strontium (Sr) | ug/L | | | 6.2 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 8.2 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | 5.4 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-22 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.0900 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 13 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.250 |
| Hardness (CaCO3) | mg/L | | | 2.5 |
| Ion Balance (% Difference) | % | | | 47.1 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 3.3 |
| Colour | TCU | | | 120 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 14 |
| Orthophosphate (P) | mg/L | | | 0.012 |
| pH | pH | **6.5-9** | **6-9.5** | 5.53 |
| Reactive Silica (SiO2) | mg/L | | | 2.7 |
| Total Suspended Solids | mg/L | | | 7.6 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 3.9 |
| Conductivity | uS/cm | | | 19 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | WC-22 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 450 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 4.5 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.022 |
| Total Calcium (Ca) | ug/L | | | 370 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | 9.5 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 3000 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 380 |
| Total Manganese (Mn) | ug/L | | | 900 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 240 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 2000 |
| Total Strontium (Sr) | ug/L | | | 4.8 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | 6.9 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.

**TABLE G.1-5 General Chemistry (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-40 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Calculated Parameters** | **Units** | | | |
| Anion Sum | me/L | | | 0.210 |
| Bicarb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Calculated TDS | mg/L | | | 14 |
| Carb. Alkalinity (calc. as CaCO3) | mg/L | | | <1.0 |
| Cation Sum | me/L | | | 0.280 |
| Hardness (CaCO3) | mg/L | | | 2.9 |
| Ion Balance (% Difference) | % | | | 14.3 |
| Langelier Index (@ 20C) | N/A | | | NC |
| Langelier Index (@ 4C) | N/A | | | NC |
| Nitrate (N) | mg/L | **2.935** | | <0.050 |
| Saturation pH (@ 20C) | N/A | | | NC |
| Saturation pH (@ 4C) | N/A | | | NC |
| **Inorganics** | | | | |
| Total Alkalinity (Total as CaCO3) | mg/L | | | <5.0 |
| Dissolved Chloride (Cl) | mg/L | | | 7.5 |
| Colour | TCU | | | 65 |
| Nitrate + Nitrite | mg/L | | | <0.050 |
| Nitrite (N) | mg/L | **0.06** | | <0.010 |
| Nitrogen (Ammonia Nitrogen) | mg/L | **Varies**[(1)] | | <0.050 |
| Total Organic Carbon (C) | mg/L | | | 5.5 |
| Orthophosphate (P) | mg/L | | | <0.010 |
| pH | pH | **6.5-9** | **6-9.5** | 5.56 |
| Reactive Silica (SiO2) | mg/L | | | 0.73 |
| Total Suspended Solids | mg/L | | | <1.0 |
| Dissolved Sulphate (SO4) | mg/L | | | <2.0 |
| Turbidity | NTU | | | 0.67 |
| Conductivity | uS/cm | | | 32 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Ammonia guideline dependent on temperature and pH, e.g., if T = 10°C, guideline for total ammonia-N varies from 83.88 mg/L at pH = 6.0 to 0.02 mg/L at pH = 10 (see CCME Fact Sheet). (2) Dissolved oxygen - lowest acceptable concentration ranges from 5.5 mg/L for warm water biota at other life stages to 9.5 mg/L for cold water biota at early life stages (see CCME Summary Table). '- denotes not analyzed; 'NC = not calculated.

**TABLE G.1-5 Metals (SW Monitoring Haul Road)**

| | | CCME FAL | MMER | SW-40 |
|---|---|---|---|---|
| **Sampling Date** | | | | **8-Jun-16** |
| **Metals** | **Units** | | | |
| Total Aluminum (Al) | ug/L | **5 / 100**[(1)] | | 200 |
| Total Antimony (Sb) | ug/L | | | <1.0 |
| Total Arsenic (As) | ug/L | **5.0** | **1000** | <1.0 |
| Total Barium (Ba) | ug/L | | | 3.2 |
| Total Beryllium (Be) | ug/L | | | <1.0 |
| Total Bismuth (Bi) | ug/L | | | <2.0 |
| Total Boron (B) | ug/L | **1500** | | <50 |
| Total Cadmium (Cd) | ug/L | **0.04 - 0.37**[(2)] | | 0.016 |
| Total Calcium (Ca) | ug/L | | | 660 |
| Total Chromium (Cr) | ug/L | | | <1.0 |
| Total Cobalt (Co) | ug/L | | | <0.40 |
| Total Copper (Cu) | ug/L | **2 - 4**[(3)] | **600** | <2.0 |
| Total Iron (Fe) | ug/L | **300** | | 210 |
| Total Lead (Pb) | ug/L | **1 - 7**[(4)] | **400** | <0.50 |
| Total Magnesium (Mg) | ug/L | | | 300 |
| Total Manganese (Mn) | ug/L | | | 53 |
| Total Molybdenum (Mo) | ug/L | **73** | | <2.0 |
| Total Nickel (Ni) | ug/L | **25 - 150**[(5)] | **1000** | <2.0 |
| Total Phosphorus (P) | ug/L | | | <100 |
| Total Potassium (K) | ug/L | | | 220 |
| Total Selenium (Se) | ug/L | **1** | | <1.0 |
| Total Silver (Ag) | ug/L | **0.1** | | <0.10 |
| Total Sodium (Na) | ug/L | | | 4800 |
| Total Strontium (Sr) | ug/L | | | 5.0 |
| Total Thallium (Tl) | ug/L | **0.8** | | <0.10 |
| Total Tin (Sn) | ug/L | | | <2.0 |
| Total Titanium (Ti) | ug/L | | | <2.0 |
| Total Uranium (U) | ug/L | **15** | | <0.10 |
| Total Vanadium (V) | ug/L | | | <2.0 |
| Total Zinc (Zn) | ug/L | **30** | **1000** | <5.0 |

**Notes:** CCME FAL - Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater Aquatic Life (provided for reference). MMER - Federal Metal Mining Effluent Regulations - guidelines shown represent maximum authorized concentrations in a grab sample (provided for reference). (1) Aluminum guideline dependent on pH. Guideline is 5 ug/L if pH <6.5 and 100 ug/L if pH ≥ 6.5 (see CCME Summary Table). (2) Cadmium guideline (updated for 2014) (µg/L) = $10^{\{0.83(\log[\text{hardness}])-2.46\}}$ for hardness between 17-280 mg/L $CaCO_3$ or a lower limit of 0.04 ug/L for hardness < 17mg/L or an upper limit of 0.37 ug/L for hardness >280 mg/L (see CCME Fact Sheet). (3) Copper guideline based on sample hardness: copper guideline (µg/L) = $e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$ for hardness ≥82 to ≤180 mg/L, or a lower limit of 2 µg/L for hardness <82 mg/L and an upper limit of 4 µg/L for hardness >180 mg/L (see CCME Summary Table). (4) Lead guideline based on sample hardness: lead guideline (µg/L) = $e^{1.273[\ln(\text{hardness})]-4.705}$ for hardness >60 to ≤180 mg/L, or a lower limit of 1 µg/L for hardness <60 mg/L and an upper limit of 7 µg/L for hardness >180 mg/L (see CCME Summary Table). (5) Nickel guideline based on sample hardness: nickel guideline (µg/L) = $e^{0.76[\ln(\text{hardness})]+1.06}$ for hardness >60 to ≤180 mg/L, or a lower limit of 25 µg/L for hardness <60 mg/L and an upper limit of 150 µg/L for hardness >180 mg/L (see CCME Summary Table). '- denotes not analyzed.