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Date Received: 17-JUN-16
Report Date: 15-JUL-16 11:09 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

# Certificate of Analysis

## Lab Work Order #: L1785001

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.17
C of C Numbers: 1, 2
Legal Site Desc:

Comments: 15-JUL-2016 This report replaces the previous version and contains additional analyses, as requested.

Brent Mack, B.Sc.
Account Manager

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | L1785001-1 | L1785001-2 | L1785001-3 | L1785001-4 | L1785001-5 |
|---|---|---|---|---|---|
| Description | Water | Water | Water | Water | Water |
| Sampled Date | 14-JUN-16 | 14-JUN-16 | 14-JUN-16 | 14-JUN-16 | 17-JUN-16 |
| Sampled Time | 14:45 | 14:45 | 14:45 | 14:00 | |
| Client ID | FB1 | E1 | DUP01 | E1(H) | TRAVEL BLANK |
| **Grouping** / **Analyte** | | | | | |
| **WATER** | | | | | |
| **Physical Tests** Conductivity (uS/cm) | <2.0 | 475 | 476 | 471 | <2.0 |
| Hardness (as CaCO3) (mg/L) | <0.50 | 264 | 265 | 262 | <0.50 |
| pH (pH) | 5.19 | 8.04 | 8.08 | 8.04 | 5.44 |
| Total Suspended Solids (mg/L) | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 |
| **Anions and Nutrients** Ammonia, Total (as N) (mg/L) | <0.0050 | 0.0208 | 0.0194 | 0.0108 | <0.0050 |
| Nitrate (as N) (mg/L) | <0.0050 | 0.0253 | 0.0241 | 0.0171 | <0.0050 |
| Nitrite (as N) (mg/L) | <0.0010 | 0.0022 | 0.0015 | <0.0010 | <0.0010 |
| Phosphorus (P)-Total (mg/L) | <0.0020 | 0.0064 | 0.0072 | 0.0077 | <0.0020 |
| Sulfate (SO4) (mg/L) | <0.30 | 136 | 136 | 135 | <0.30 |
| **Organic / Inorganic Carbon** Dissolved Organic Carbon (mg/L) | <0.50 | 15.5 | 15.4 | 16.2 | |
| Total Organic Carbon (mg/L) | | | | | 1.18 |
| **Total Metals** Aluminum (Al)-Total (mg/L) | <0.0030 | 0.0420 | 0.0373 | 0.0493 | <0.0030 |
| Antimony (Sb)-Total (mg/L) | <0.00010 | 0.00029 | 0.00031 | 0.00025 | <0.00010 |
| Arsenic (As)-Total (mg/L) | <0.00010 | 0.00066 | 0.00061 | 0.00062 | <0.00010 |
| Barium (Ba)-Total (mg/L) | <0.000050 | 0.0473 | 0.0466 | 0.0457 | <0.000050 |
| Beryllium (Be)-Total (mg/L) | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Bismuth (Bi)-Total (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Boron (B)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Cadmium (Cd)-Total (mg/L) | <0.0000050 | 0.0000355 | 0.0000408 | 0.0000304 | <0.0000050 |
| Calcium (Ca)-Total (mg/L) | <0.050 | 56.2 | 56.9 | 55.8 | <0.050 |
| Chromium (Cr)-Total (mg/L) | <0.00010 | 0.00047 | 0.00048 | 0.00046 | <0.00010 |
| Cobalt (Co)-Total (mg/L) | <0.00010 | 0.00030 | 0.00031 | 0.00037 | <0.00010 |
| Copper (Cu)-Total (mg/L) | <0.00050 | 0.00256 | 0.00262 | 0.00255 | <0.00050 |
| Iron (Fe)-Total (mg/L) | <0.010 | 0.141 | 0.140 | 0.170 | <0.010 |
| Lead (Pb)-Total (mg/L) | <0.000050 | <0.000050 | <0.000050 | 0.000054 | <0.000050 |
| Lithium (Li)-Total (mg/L) | <0.0010 | 0.0023 | 0.0022 | 0.0023 | <0.0010 |
| Magnesium (Mg)-Total (mg/L) | <0.10 | 26.7 | 28.2 | 26.5 | <0.10 |
| Manganese (Mn)-Total (mg/L) | <0.00010 | 0.0717 | 0.0727 | 0.0967 | <0.00010 |
| Mercury (Hg)-Total (mg/L) | <0.0000050 | 0.0000050 | <0.0000050 | 0.0000052 | <0.0000050 |
| Molybdenum (Mo)-Total (mg/L) | <0.000050 | 0.00110 | 0.00109 | 0.00103 | <0.000050 |
| Nickel (Ni)-Total (mg/L) | <0.00050 | 0.00459 | 0.00463 | 0.00380 | <0.00050 |
| Phosphorus (P)-Total (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Potassium (K)-Total (mg/L) | <0.10 | 0.62 | 0.65 | 0.62 | <0.10 |
| Selenium (Se)-Total (mg/L) | <0.000050 | 0.00219 | 0.00208 | 0.00206 | <0.000050 |
| Silicon (Si)-Total (mg/L) | <0.050 | 3.59 | 3.64 | 3.62 | <0.050 |
| Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1785001-6 Water 15-JUN-16 15:30 E8 | L1785001-7 Water 15-JUN-16 14:13 E7 | L1785001-8 Water 15-JUN-16 14:13 DUP02 | L1785001-9 Water 15-JUN-16 14:13 E4 | L1785001-10 Water 15-JUN-16 12:00 R4 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Physical Tests** | Conductivity (uS/cm) | 166 | 737 | 734 | 715 | 636 |
| | Hardness (as CaCO3) (mg/L) | 75.8 | 427 | 428 | 415 | 368 |
| | pH (pH) | 7.69 | 8.12 | 8.13 | 8.12 | 8.22 |
| | Total Suspended Solids (mg/L) | 5.3 | 4.0 | 6.0 | 3.3 | 19.3 |
| **Anions and Nutrients** | Ammonia, Total (as N) (mg/L) | 0.0066 | 0.0067 | 0.0078 | 0.0119 | 0.0116 |
| | Nitrate (as N) (mg/L) | 0.0365 | 0.0595 | 0.0601 | 0.0446 | 0.117 |
| | Nitrite (as N) (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | 0.0077 | 0.0025 | 0.0044 | 0.0055 | 0.0122 |
| | Sulfate (SO4) (mg/L) | 27.9 | 233 | 233 | 230 | 175 |
| **Organic / Inorganic Carbon** | Dissolved Organic Carbon (mg/L) | 17.9 | 13.3 | 13.1 | 13.1 | 13.0 |
| | Total Organic Carbon (mg/L) | | | | | |
| **Total Metals** | Aluminum (Al)-Total (mg/L) | 0.351 | 0.0473 | 0.0434 | 0.0430 | 0.365 |
| | Antimony (Sb)-Total (mg/L) | 0.00012 | 0.00043 | 0.00045 | 0.00048 | 0.00040 |
| | Arsenic (As)-Total (mg/L) | 0.00074 | 0.00085 | 0.00084 | 0.00095 | 0.00185 |
| | Barium (Ba)-Total (mg/L) | 0.0328 | 0.0498 | 0.0524 | 0.0465 | 0.0660 |
| | Beryllium (Be)-Total (mg/L) | 0.000033 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Boron (B)-Total (mg/L) | <0.010 | 0.040 | 0.042 | 0.045 | <0.010 |
| | Cadmium (Cd)-Total (mg/L) | 0.0000259 | 0.0000484 | 0.0000471 | 0.0000404 | 0.0000830 |
| | Calcium (Ca)-Total (mg/L) | 19.5 | 76.4 | 78.5 | 73.9 | 74.5 |
| | Chromium (Cr)-Total (mg/L) | 0.00086 | 0.00072 | 0.00068 | 0.00068 | 0.00141 |
| | Cobalt (Co)-Total (mg/L) | 0.00040 | 0.00056 | 0.00054 | 0.00052 | 0.00075 |
| | Copper (Cu)-Total (mg/L) | 0.00370 | 0.00217 | 0.00216 | 0.00214 | 0.00298 |
| | Iron (Fe)-Total (mg/L) | 0.609 | 0.287 | 0.292 | 0.255 | 0.765 |
| | Lead (Pb)-Total (mg/L) | 0.000164 | 0.000084 | 0.000065 | <0.000050 | 0.000393 |
| | Lithium (Li)-Total (mg/L) | 0.0034 | 0.0105 | 0.0109 | 0.0100 | 0.0037 |
| | Magnesium (Mg)-Total (mg/L) | 7.10 | 54.2 | 55.4 | 51.7 | 37.5 |
| | Manganese (Mn)-Total (mg/L) | 0.0249 | 0.169 | 0.175 | 0.0965 | 0.115 |
| | Mercury (Hg)-Total (mg/L) | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| | Molybdenum (Mo)-Total (mg/L) | 0.000392 | 0.00129 | 0.00131 | 0.00146 | 0.00130 |
| | Nickel (Ni)-Total (mg/L) | 0.00299 | 0.0126 | 0.0130 | 0.0139 | 0.0171 |
| | Phosphorus (P)-Total (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Potassium (K)-Total (mg/L) | 1.01 | 0.98 | 1.01 | 0.89 | 0.54 |
| | Selenium (Se)-Total (mg/L) | 0.000150 | 0.00126 | 0.00118 | 0.00165 | 0.00159 |
| | Silicon (Si)-Total (mg/L) | 5.12 | 4.20 | 4.27 | 4.13 | 5.34 |
| | Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000015 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | L1785001-11 | L1785001-12 | L1785001-13 | L1785001-14 | L1785001-15 |
|---|---|---|---|---|---|
| Description | Water | Water | Water | Water | Water |
| Sampled Date | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 14-JUN-16 |
| Sampled Time | 09:40 | 08:30 | 09:15 | 09:00 | 16:10 |
| Client ID | GWCC-4 | GWCC-1 | GWCC-3 | GWCC-2 | GWCC-5 |
| **Grouping** / **Analyte** | | | | | |
| **WATER** | | | | | |
| **Physical Tests** Conductivity (uS/cm) | 814 | 2500 | 1030 | 1810 | 911 |
| Hardness (as CaCO3) (mg/L) | 474 | 1680 | 622 | 1160 | 530 |
| pH (pH) | 8.05 | 8.05 | 8.07 | 8.12 | 8.09 |
| Total Suspended Solids (mg/L) | <3.0 | <3.0 | <3.0 | <3.0 | <3.0 |
| **Anions and Nutrients** Ammonia, Total (as N) (mg/L) | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Nitrate (as N) (mg/L) | 0.0850 | 0.550 DLDS | 0.154 DLDS | 0.385 DLDS | 0.0156 |
| Nitrite (as N) (mg/L) | <0.0010 | <0.0050 | <0.0020 | <0.0050 | <0.0010 |
| Phosphorus (P)-Total (mg/L) | <0.0020 | <0.0020 | <0.0020 | <0.0020 | 0.0048 |
| Sulfate (SO4) (mg/L) | 258 | 1290 | 380 | 860 | 279 |
| **Organic / Inorganic Carbon** Dissolved Organic Carbon (mg/L) | 10.1 | 5.72 | 9.24 | 7.22 | 7.45 |
| Total Organic Carbon (mg/L) | | | | | |
| **Total Metals** Aluminum (Al)-Total (mg/L) | 0.0036 | <0.0030 | <0.0030 | <0.0030 | 0.0031 |
| Antimony (Sb)-Total (mg/L) | 0.00110 | 0.00130 | 0.00103 | 0.00115 | 0.00098 |
| Arsenic (As)-Total (mg/L) | 0.00103 | 0.00226 | 0.00079 | 0.00148 | 0.00065 |
| Barium (Ba)-Total (mg/L) | 0.0257 | 0.0182 | 0.0270 | 0.0170 | 0.0492 |
| Beryllium (Be)-Total (mg/L) | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| Bismuth (Bi)-Total (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Boron (B)-Total (mg/L) | 0.059 | 0.273 | 0.071 | 0.129 | 0.038 |
| Cadmium (Cd)-Total (mg/L) | 0.0000451 | 0.000170 | 0.0000643 | 0.000141 | 0.000107 |
| Calcium (Ca)-Total (mg/L) | 81.8 | 195 | 99.9 | 158 | 119 |
| Chromium (Cr)-Total (mg/L) | 0.00050 | 0.00287 | 0.00045 | 0.00135 | 0.00067 |
| Cobalt (Co)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Copper (Cu)-Total (mg/L) | 0.00145 | 0.00109 | 0.00138 | 0.00134 | 0.00089 |
| Iron (Fe)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | 0.019 |
| Lead (Pb)-Total (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Lithium (Li)-Total (mg/L) | 0.0070 | 0.0764 | 0.0069 | 0.0131 | 0.0092 |
| Magnesium (Mg)-Total (mg/L) | 61.4 | 284 | 82.7 | 184 | 55.1 |
| Manganese (Mn)-Total (mg/L) | 0.00030 | 0.00028 | <0.00010 | <0.00010 | 0.00118 |
| Mercury (Hg)-Total (mg/L) | 0.0000059 | <0.0000050 | 0.0000060 | 0.0000058 | <0.0000050 |
| Molybdenum (Mo)-Total (mg/L) | 0.00219 | 0.00261 | 0.00229 | 0.00269 | 0.00208 |
| Nickel (Ni)-Total (mg/L) | 0.0304 | 0.0693 | 0.0282 | 0.0396 | 0.0180 |
| Phosphorus (P)-Total (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| Potassium (K)-Total (mg/L) | 1.03 | 3.21 | 1.21 | 1.91 | 0.81 |
| Selenium (Se)-Total (mg/L) | 0.00104 | 0.00501 | 0.00153 | 0.00341 | 0.00935 |
| Silicon (Si)-Total (mg/L) | 5.19 | 6.17 | 4.74 | 4.99 | 4.49 |
| Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1785001-16 | L1785001-17 | | | |
|---|---|---|---|---|---|---|
| | Description | Water | Water | | | |
| | Sampled Date | 14-JUN-16 | 15-JUN-16 | | | |
| | Sampled Time | 17:00 | 10:20 | | | |
| | Client ID | E3 | E2 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Physical Tests** | Conductivity (uS/cm) | 703 | 657 | | | |
| | Hardness (as CaCO3) (mg/L) | 393 | 373 | | | |
| | pH (pH) | 8.20 | 8.11 | | | |
| | Total Suspended Solids (mg/L) | | | | | |
| **Anions and Nutrients** | Ammonia, Total (as N) (mg/L) | 0.0083 | 0.0175 | | | |
| | Nitrate (as N) (mg/L) | 0.0824 | 0.0478 | | | |
| | Nitrite (as N) (mg/L) | <0.0010 | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0106 | 0.0056 | | | |
| | Sulfate (SO4) (mg/L) | 220 | 210 | | | |
| **Organic / Inorganic Carbon** | Dissolved Organic Carbon (mg/L) | 13.8 | 13.9 | | | |
| | Total Organic Carbon (mg/L) | | | | | |
| **Total Metals** | Aluminum (Al)-Total (mg/L) | 0.361 | 0.0321 | | | |
| | Antimony (Sb)-Total (mg/L) | 0.00076 | 0.00045 | | | |
| | Arsenic (As)-Total (mg/L) | 0.00137 | 0.00094 | | | |
| | Barium (Ba)-Total (mg/L) | 0.0657 | 0.0478 | | | |
| | Beryllium (Be)-Total (mg/L) | <0.000020 | <0.000020 | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | <0.000050 | | | |
| | Boron (B)-Total (mg/L) | 0.058 | 0.031 | | | |
| | Cadmium (Cd)-Total (mg/L) | 0.0000211 | 0.0000477 | | | |
| | Calcium (Ca)-Total (mg/L) | 68.0 | 70.0 | | | |
| | Chromium (Cr)-Total (mg/L) | 0.00171 | 0.00060 | | | |
| | Cobalt (Co)-Total (mg/L) | 0.00039 | 0.00051 | | | |
| | Copper (Cu)-Total (mg/L) | 0.00253 | 0.00231 | | | |
| | Iron (Fe)-Total (mg/L) | 0.766 | 0.197 | | | |
| | Lead (Pb)-Total (mg/L) | 0.000280 | <0.000050 | | | |
| | Lithium (Li)-Total (mg/L) | 0.0049 | 0.0065 | | | |
| | Magnesium (Mg)-Total (mg/L) | 52.2 | 45.5 | | | |
| | Manganese (Mn)-Total (mg/L) | 0.0706 | 0.0812 | | | |
| | Mercury (Hg)-Total (mg/L) | 0.0000050 | 0.0000053 | | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.00131 | 0.00140 | | | |
| | Nickel (Ni)-Total (mg/L) | 0.00970 | 0.0120 | | | |
| | Phosphorus (P)-Total (mg/L) | <0.050 | <0.050 | | | |
| | Potassium (K)-Total (mg/L) | 0.90 | 0.84 | | | |
| | Selenium (Se)-Total (mg/L) | 0.000881 | 0.00198 | | | |
| | Silicon (Si)-Total (mg/L) | 6.22 | 3.90 | | | |
| | Silver (Ag)-Total (mg/L) | 0.000011 | <0.000010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1785001-1 Water 14-JUN-16 14:45 FB1 | L1785001-2 Water 14-JUN-16 14:45 E1 | L1785001-3 Water 14-JUN-16 14:45 DUP01 | L1785001-4 Water 14-JUN-16 14:00 E1(H) | L1785001-5 Water 17-JUN-16 TRAVEL BLANK |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Total Metals** | Sodium (Na)-Total (mg/L) | <0.050 | 2.37 | 2.41 | 2.38 | <0.050 |
| | Strontium (Sr)-Total (mg/L) | <0.00020 | 0.267 | 0.264 | 0.256 | <0.00020 |
| | Sulfur (S)-Total (mg/L) | <0.50 | 48.5 | 48.3 | 46.8 | <0.50 |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | <0.000010 | 0.000011 | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | <0.00030 | 0.00059 | 0.00058 | 0.00070 | <0.00030 |
| | Uranium (U)-Total (mg/L) | <0.000010 | 0.00185 | 0.00184 | 0.00185 | <0.000010 |
| | Vanadium (V)-Total (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | <0.0030 | <0.0030 | <0.0030 | <0.0030 |
| | Zirconium (Zr)-Total (mg/L) | <0.00030 | 0.00056 | 0.00058 | 0.00060 | <0.00030 |
| **Dissolved Metals** | Dissolved Mercury Filtration Location | FIELD | FIELD | FIELD | FIELD | |
| | Dissolved Metals Filtration Location | FIELD | FIELD | FIELD | FIELD | |
| | Aluminum (Al)-Dissolved (mg/L) | <0.0010 | 0.0280 | 0.0301 | 0.0305 | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | 0.00027 | 0.00027 | 0.00025 | |
| | Arsenic (As)-Dissolved (mg/L) | <0.00010 | 0.00060 | 0.00061 | 0.00056 | |
| | Barium (Ba)-Dissolved (mg/L) | <0.000050 | 0.0462 | 0.0457 | 0.0458 | |
| | Beryllium (Be)-Dissolved (mg/L) | <0.000020 | <0.000020 | <0.000020 | <0.000020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Cadmium (Cd)-Dissolved (mg/L) | <0.0000050 | 0.0000355 | 0.0000364 | 0.0000304 | |
| | Calcium (Ca)-Dissolved (mg/L) | <0.050 | 58.2 | 58.9 | 57.9 | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | 0.00036 | 0.00037 | 0.00029 | |
| | Cobalt (Co)-Dissolved (mg/L) | <0.00010 | 0.00026 | 0.00026 | 0.00033 | |
| | Copper (Cu)-Dissolved (mg/L) | <0.00020 | 0.00242 | 0.00245 | 0.00250 | |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | 0.100 | 0.100 | 0.116 | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | |
| | Lithium (Li)-Dissolved (mg/L) | <0.0010 | 0.0024 | 0.0024 | 0.0024 | |
| | Magnesium (Mg)-Dissolved (mg/L) | <0.10 | 28.9 | 28.7 | 28.4 | |
| | Manganese (Mn)-Dissolved (mg/L) | <0.00010 | 0.0575 | 0.0583 | 0.0762 | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | 0.0000050 | <0.0000050 | <0.0000050 | |
| | Molybdenum (Mo)-Dissolved (mg/L) | <0.000050 | 0.00101 | 0.000965 | 0.000941 | |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | 0.00430 | 0.00435 | 0.00370 | |
| | Phosphorus (P)-Dissolved (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | |
| | Potassium (K)-Dissolved (mg/L) | <0.10 | 0.64 | 0.66 | 0.65 | |
| | Selenium (Se)-Dissolved (mg/L) | <0.000050 | 0.00220 | 0.00217 | 0.00213 | |
| | Silicon (Si)-Dissolved (mg/L) | <0.050 | 3.59 | 3.63 | 3.62 | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1785001-6 Water 15-JUN-16 15:30 E8 | L1785001-7 Water 15-JUN-16 14:13 E7 | L1785001-8 Water 15-JUN-16 14:13 DUP02 | L1785001-9 Water 15-JUN-16 14:13 E4 | L1785001-10 Water 15-JUN-16 12:00 R4 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Total Metals** | Sodium (Na)-Total (mg/L) | 3.19 | 4.05 | 4.16 | 3.82 | 4.59 |
| | Strontium (Sr)-Total (mg/L) | 0.115 | 0.432 | 0.440 | 0.427 | 0.402 |
| | Sulfur (S)-Total (mg/L) | 9.68 | 81.9 | 83.3 | 79.9 | 58.3 |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | 0.000016 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | 0.0109 | 0.00135 | 0.00107 | 0.00108 | 0.00815 |
| | Uranium (U)-Total (mg/L) | 0.000650 | 0.00216 | 0.00219 | 0.00211 | 0.00443 |
| | Vanadium (V)-Total (mg/L) | 0.00144 | <0.00050 | <0.00050 | <0.00050 | 0.00133 |
| | Zinc (Zn)-Total (mg/L) | 0.0034 | <0.0030 | 0.0031 | <0.0030 | 0.0040 |
| | Zirconium (Zr)-Total (mg/L) | 0.00081 | 0.00084 | 0.00082 | 0.00073 | 0.00109 |
| **Dissolved Metals** | Dissolved Mercury Filtration Location | FIELD | FIELD | FIELD | FIELD | FIELD |
| | Dissolved Metals Filtration Location | FIELD | FIELD | FIELD | FIELD | FIELD |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0977 | 0.0148 | 0.0138 | 0.0158 | 0.0229 |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | 0.00039 | 0.00041 | 0.00048 | 0.00036 |
| | Arsenic (As)-Dissolved (mg/L) | 0.00054 | 0.00079 | 0.00071 | 0.00090 | 0.00152 |
| | Barium (Ba)-Dissolved (mg/L) | 0.0296 | 0.0486 | 0.0494 | 0.0472 | 0.0576 |
| | Beryllium (Be)-Dissolved (mg/L) | 0.000031 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | <0.010 | 0.039 | 0.039 | 0.043 | <0.010 |
| | Cadmium (Cd)-Dissolved (mg/L) | 0.0000137 | 0.0000422 | 0.0000365 | 0.0000377 | 0.0000534 |
| | Calcium (Ca)-Dissolved (mg/L) | 19.3 | 79.5 | 79.8 | 77.7 | 81.6 |
| | Chromium (Cr)-Dissolved (mg/L) | 0.00041 | 0.00052 | 0.00053 | 0.00053 | 0.00037 |
| | Cobalt (Co)-Dissolved (mg/L) | 0.00021 | 0.00051 | 0.00050 | 0.00048 | 0.00051 |
| | Copper (Cu)-Dissolved (mg/L) | 0.00312 | 0.00211 | 0.00207 | 0.00194 | 0.00205 |
| | Iron (Fe)-Dissolved (mg/L) | 0.230 | 0.202 | 0.203 | 0.186 | 0.137 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0033 | 0.0110 | 0.0111 | 0.0103 | 0.0037 |
| | Magnesium (Mg)-Dissolved (mg/L) | 6.68 | 55.6 | 55.5 | 53.6 | 39.9 |
| | Manganese (Mn)-Dissolved (mg/L) | 0.0126 | 0.176 | 0.167 | 0.0868 | 0.0980 |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000364 | 0.00130 | 0.00123 | 0.00134 | 0.00116 |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00250 | 0.0128 | 0.0125 | 0.0133 | 0.0153 |
| | Phosphorus (P)-Dissolved (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Potassium (K)-Dissolved (mg/L) | 0.89 | 1.02 | 1.04 | 0.94 | 0.56 |
| | Selenium (Se)-Dissolved (mg/L) | 0.000189 | 0.00126 | 0.00123 | 0.00153 | 0.00163 |
| | Silicon (Si)-Dissolved (mg/L) | 4.52 | 4.22 | 4.23 | 4.15 | 5.11 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1785001-11 | L1785001-12 | L1785001-13 | L1785001-14 | L1785001-15 |
|---|---|---|---|---|---|---|
| | Description | Water | Water | Water | Water | Water |
| | Sampled Date | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 14-JUN-16 |
| | Sampled Time | 09:40 | 08:30 | 09:15 | 09:00 | 16:10 |
| | Client ID | GWCC-4 | GWCC-1 | GWCC-3 | GWCC-2 | GWCC-5 |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Total Metals** | Sodium (Na)-Total (mg/L) | 2.83 | 16.1 | 3.40 | 5.85 | 3.59 |
| | Strontium (Sr)-Total (mg/L) | 0.393 | 1.80 | 0.489 | 0.813 | 0.679 |
| | Sulfur (S)-Total (mg/L) | 89.2 | 432 | 126 | 284 | 98.7 |
| | Thallium (Tl)-Total (mg/L) | 0.000051 | 0.000080 | 0.000054 | 0.000055 | 0.000014 |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | <0.00030 | <0.00030 | <0.00030 | <0.00030 | <0.00030 |
| | Uranium (U)-Total (mg/L) | 0.00110 | 0.00616 | 0.00143 | 0.00268 | 0.00217 |
| | Vanadium (V)-Total (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | 0.0066 | <0.0030 | 0.0049 | <0.0030 |
| | Zirconium (Zr)-Total (mg/L) | <0.00030 | <0.00030 | <0.00030 | <0.00030 | <0.00030 |
| **Dissolved Metals** | Dissolved Mercury Filtration Location | FIELD | FIELD | FIELD | FIELD | FIELD |
| | Dissolved Metals Filtration Location | FIELD | FIELD | FIELD | FIELD | FIELD |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0024 | 0.0012 | 0.0018 | 0.0013 | 0.0021 |
| | Antimony (Sb)-Dissolved (mg/L) | 0.00116 | 0.00128 | 0.00103 | 0.00113 | 0.00094 |
| | Arsenic (As)-Dissolved (mg/L) | 0.00107 | 0.00232 | 0.00080 | 0.00152 | 0.00062 |
| | Barium (Ba)-Dissolved (mg/L) | 0.0273 | 0.0189 | 0.0270 | 0.0173 | 0.0504 |
| | Beryllium (Be)-Dissolved (mg/L) | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | 0.056 | 0.253 | 0.067 | 0.127 | 0.035 |
| | Cadmium (Cd)-Dissolved (mg/L) | 0.0000421 | 0.000164 | 0.0000690 | 0.000147 | 0.000110 |
| | Calcium (Ca)-Dissolved (mg/L) | 85.0 | 199 | 106 | 162 | 122 |
| | Chromium (Cr)-Dissolved (mg/L) | 0.00043 | 0.00296 | 0.00042 | 0.00125 | 0.00065 |
| | Cobalt (Co)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Copper (Cu)-Dissolved (mg/L) | 0.00149 | 0.00093 | 0.00133 | 0.00119 | 0.00086 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | 0.020 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0068 | 0.0731 | 0.0072 | 0.0131 | 0.0091 |
| | Magnesium (Mg)-Dissolved (mg/L) | 63.7 | 288 | 86.5 | 184 | 55.0 |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00014 | 0.00017 | <0.00010 | <0.00010 | 0.00135 |
| | Mercury (Hg)-Dissolved (mg/L) | 0.0000060 | <0.0000050 | 0.0000065 | <0.0000050 | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00204 | 0.00258 | 0.00216 | 0.00252 | 0.00195 |
| | Nickel (Ni)-Dissolved (mg/L) | 0.0298 | 0.0741 | 0.0282 | 0.0386 | 0.0176 |
| | Phosphorus (P)-Dissolved (mg/L) | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Potassium (K)-Dissolved (mg/L) | 1.06 | 3.25 | 1.28 | 1.95 | 0.79 |
| | Selenium (Se)-Dissolved (mg/L) | 0.00101 | 0.00509 | 0.00149 | 0.00359 | 0.00987 |
| | Silicon (Si)-Dissolved (mg/L) | 5.24 | 6.13 | 4.93 | 5.01 | 4.52 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1785001-16 | L1785001-17 | | | |
|---|---|---|---|---|---|---|
| | Description | Water | Water | | | |
| | Sampled Date | 14-JUN-16 | 15-JUN-16 | | | |
| | Sampled Time | 17:00 | 10:20 | | | |
| | Client ID | E3 | E2 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Total Metals** | Sodium (Na)-Total (mg/L) | 4.49 | 3.24 | | | |
| | Strontium (Sr)-Total (mg/L) | 0.345 | 0.370 | | | |
| | Sulfur (S)-Total (mg/L) | 79.2 | 74.6 | | | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | 0.000021 | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | 0.0102 | 0.00053 | | | |
| | Uranium (U)-Total (mg/L) | 0.00364 | 0.00192 | | | |
| | Vanadium (V)-Total (mg/L) | 0.00164 | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | <0.0030 | | | |
| | Zirconium (Zr)-Total (mg/L) | 0.00065 | 0.00051 | | | |
| **Dissolved Metals** | Dissolved Mercury Filtration Location | FIELD | FIELD | | | |
| | Dissolved Metals Filtration Location | FIELD | FIELD | | | |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0256 | 0.0215 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | 0.00071 | 0.00042 | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00101 | 0.00087 | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.0519 | 0.0479 | | | |
| | Beryllium (Be)-Dissolved (mg/L) | <0.000020 | <0.000020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | 0.052 | 0.031 | | | |
| | Cadmium (Cd)-Dissolved (mg/L) | 0.0000121 | 0.0000474 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 67.8 | 72.8 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | 0.00085 | 0.00045 | | | |
| | Cobalt (Co)-Dissolved (mg/L) | 0.00022 | 0.00046 | | | |
| | Copper (Cu)-Dissolved (mg/L) | 0.00193 | 0.00216 | | | |
| | Iron (Fe)-Dissolved (mg/L) | 0.126 | 0.156 | | | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | 0.0040 | 0.0066 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 54.3 | 46.6 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.0589 | 0.0716 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00127 | 0.00127 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00817 | 0.0115 | | | |
| | Phosphorus (P)-Dissolved (mg/L) | <0.050 | <0.050 | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.77 | 0.87 | | | |
| | Selenium (Se)-Dissolved (mg/L) | 0.000919 | 0.00191 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 5.24 | 3.91 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1785001-1 Water 14-JUN-16 14:45 FB1 | L1785001-2 Water 14-JUN-16 14:45 E1 | L1785001-3 Water 14-JUN-16 14:45 DUP01 | L1785001-4 Water 14-JUN-16 14:00 E1(H) | L1785001-5 Water 17-JUN-16 TRAVEL BLANK |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Dissolved Metals** | Sodium (Na)-Dissolved (mg/L) | <0.050 | 2.38 | 2.39 | 2.41 | |
| | Strontium (Sr)-Dissolved (mg/L) | <0.00020 | 0.263 | 0.256 | 0.255 | |
| | Sulfur (S)-Dissolved (mg/L) | <0.50 | 48.2 | 47.1 | 47.2 | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | 0.000015 | <0.000010 | <0.000010 | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.00030 | 0.00030 | 0.00042 | 0.00039 | |
| | Uranium (U)-Dissolved (mg/L) | <0.000010 | 0.00178 | 0.00173 | 0.00178 | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | 0.0019 | 0.0019 | 0.0043 | |
| | Zirconium (Zr)-Dissolved (mg/L) | <0.00030 | 0.00060 | 0.00058 | 0.00062 | |
| **Speciated Metals** | Chromium (III)-Dissolved (mg/L) | | | | | |
| | Chromium (III)-Total (mg/L) | | | | | |
| | Hexavalent Chromium (mg/L) | | | | | |
| | Hexavalent Chromium-Dissolved (mg/L) | | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1785001-6 | L1785001-7 | L1785001-8 | L1785001-9 | L1785001-10 |
|---|---|---|---|---|---|---|
| | Description | Water | Water | Water | Water | Water |
| | Sampled Date | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 | 15-JUN-16 |
| | Sampled Time | 15:30 | 14:13 | 14:13 | 14:13 | 12:00 |
| | Client ID | E8 | E7 | DUP02 | E4 | R4 |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Dissolved Metals** | Sodium (Na)-Dissolved (mg/L) | 3.02 | 3.97 | 4.11 | 4.02 | 4.81 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.111 | 0.435 | 0.431 | 0.420 | 0.408 |
| | Sulfur (S)-Dissolved (mg/L) | 9.70 | 82.3 | 81.2 | 80.2 | 60.1 |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | 0.000014 | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | 0.00122 | 0.00037 | 0.00034 | 0.00036 | 0.00062 |
| | Uranium (U)-Dissolved (mg/L) | 0.000602 | 0.00206 | 0.00205 | 0.00204 | 0.00418 |
| | Vanadium (V)-Dissolved (mg/L) | 0.00069 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0024 | 0.0025 | 0.0024 | 0.0015 | 0.0068 |
| | Zirconium (Zr)-Dissolved (mg/L) | 0.00085 | 0.00088 | 0.00086 | 0.00068 | 0.00119 |
| **Speciated Metals** | Chromium (III)-Dissolved (mg/L) | | | | | |
| | Chromium (III)-Total (mg/L) | | | | | <0.00073 |
| | Hexavalent Chromium (mg/L) | | | | | 0.0011 |
| | Hexavalent Chromium-Dissolved (mg/L) | | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1785001-11 Water 15-JUN-16 09:40 GWCC-4 | L1785001-12 Water 15-JUN-16 08:30 GWCC-1 | L1785001-13 Water 15-JUN-16 09:15 GWCC-3 | L1785001-14 Water 15-JUN-16 09:00 GWCC-2 | L1785001-15 Water 14-JUN-16 16:10 GWCC-5 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Dissolved Metals** | Sodium (Na)-Dissolved (mg/L) | 3.04 | 16.2 | 3.44 | 5.89 | 3.54 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.386 | 1.90 | 0.486 | 0.809 | 0.668 |
| | Sulfur (S)-Dissolved (mg/L) | 88.9 | 431 | 130 | 285 | 94.3 |
| | Thallium (Tl)-Dissolved (mg/L) | 0.000050 | 0.000085 | 0.000058 | 0.000054 | 0.000014 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.00030 | <0.00030 | <0.00030 | <0.00030 | <0.00030 |
| | Uranium (U)-Dissolved (mg/L) | 0.00108 | 0.00656 | 0.00138 | 0.00256 | 0.00210 |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0037 | 0.0069 | 0.0021 | 0.0045 | <0.0010 |
| | Zirconium (Zr)-Dissolved (mg/L) | <0.00030 | <0.00030 | <0.00030 | <0.00030 | <0.00030 |
| **Speciated Metals** | Chromium (III)-Dissolved (mg/L) | | <0.00064 | | <0.00042 | |
| | Chromium (III)-Total (mg/L) | | <0.00088 | | <0.00073 | |
| | Hexavalent Chromium (mg/L) | | 0.0036 | | 0.0021 | |
| | Hexavalent Chromium-Dissolved (mg/L) | | 0.0037 | | 0.0019 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1785001-16 | L1785001-17 | | | |
|---|---|---|---|---|---|---|
| | Description | Water | Water | | | |
| | Sampled Date | 14-JUN-16 | 15-JUN-16 | | | |
| | Sampled Time | 17:00 | 10:20 | | | |
| | Client ID | E3 | E2 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Dissolved Metals** | Sodium (Na)-Dissolved (mg/L) | 4.59 | 3.28 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.338 | 0.364 | | | |
| | Sulfur (S)-Dissolved (mg/L) | 78.9 | 74.4 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | 0.000017 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | 0.00057 | <0.00030 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.00345 | 0.00184 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0013 | 0.0033 | | | |
| | Zirconium (Zr)-Dissolved (mg/L) | 0.00057 | 0.00052 | | | |
| **Speciated Metals** | Chromium (III)-Dissolved (mg/L) | | | | | |
| | Chromium (III)-Total (mg/L) | <0.00074 | | | | |
| | Hexavalent Chromium (mg/L) | 0.0012 | | | | |
| | Hexavalent Chromium-Dissolved (mg/L) | | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# Reference Information

**QC Samples with Qualifiers & Comments:**

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---|---|---|---|
| Duplicate | Beryllium (Be)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Aluminum (Al)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Antimony (Sb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Bismuth (Bi)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Cadmium (Cd)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Copper (Cu)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Lead (Pb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Silver (Ag)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Tin (Sn)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Titanium (Ti)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Vanadium (V)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Zirconium (Zr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Beryllium (Be)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Antimony (Sb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Bismuth (Bi)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Cadmium (Cd)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Chromium (Cr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Lead (Pb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Selenium (Se)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Silver (Ag)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Thallium (Tl)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Titanium (Ti)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Vanadium (V)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Zirconium (Zr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Beryllium (Be)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Antimony (Sb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Bismuth (Bi)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Chromium (Cr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Silver (Ag)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Tin (Sn)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Titanium (Ti)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Vanadium (V)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |

# Reference Information

| | Parameter | Qualifier | Applies to Sample Number(s) |
|---|---|---|---|
| Duplicate | Zirconium (Zr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Selenium (Se)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Bismuth (Bi)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Chromium (Cr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Copper (Cu)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Lead (Pb)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Selenium (Se)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Silver (Ag)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Tin (Sn)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Titanium (Ti)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Vanadium (V)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Zinc (Zn)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Zirconium (Zr)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Aluminum (Al)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Duplicate | Selenium (Se)-Dissolved | DLA | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Boron (B)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Silicon (Si)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Sulfur (S)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Sulfate (SO4) | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Sulfate (SO4) | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Total Organic Carbon | MS-B | L1785001-5 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |

# Reference Information

| | Parameter | Qualifier | Applies to Sample Number(s) |
|---|---|---|---|
| Matrix Spike | Aluminum (Al)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Nickel (Ni)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L1785001-15, -16, -17 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L1785001-15, -16, -17 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1785001-2, -4, -6 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1785001-2, -4, -6 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L1785001-6 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L1785001-6 |
| Matrix Spike | Arsenic (As)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Cadmium (Cd)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Cobalt (Co)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Nickel (Ni)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Zinc (Zn)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9 |

**Qualifiers for Individual Parameters Listed:**

| Qualifier | Description |
|---|---|
| DLA | Detection Limit adjusted for required dilution |
| DLDS | Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

## Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| **BE-D-L-CCMS-VA** | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

| | | | |
|---|---|---|---|
| **BE-T-L-CCMS-VA** | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

# Reference Information

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

**CARBONS-DOC-VA** Water Dissolved organic carbon by combustion APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

**CARBONS-TOC-VA** Water Total organic carbon by combustion APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

**CR-CR3-DIS-CALC-ED** Water Dissolved Trivalent Chromium in Water CALCULATION

Chromium (III)-Dissolved is calculated as the difference between the dissolved chromium and the dissolved hexavalent chromium (Cr(VI)) results.

**CR-CR3-TOT-CALC-ED** Water Total Trivalent Chromium in Water CALCULATION

Chromium (III)-Total is calculated as the difference between the total chromium and the hexavalent chromium (Cr(VI)) results.

**CR-CR6-ED** Water Chromium, Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on an un-filtered, field-preserved sample.

**CR6-D-IC-ED** Water Chromium, Dissolved Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on a field-filtered, field-preserved sample.

**EC-PCT-VA** Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

**HARDNESS-CALC-VA** Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

**HG-D-CVAA-VA** Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

**HG-T-CVAA-VA** Water Total Mercury in Water by CVAAS or CVAFS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

**MET-D-CCMS-VA** Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

**MET-DIS-LOW-ICP-VA** Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**MET-T-CCMS-VA** Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

**MET-TOT-LOW-ICP-VA** Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method

# Reference Information

6010B).

| | | | |
|---|---|---|---|
| **NH3-F-VA** | Water | Ammonia in Water by Fluorescence | APHA 4500 NH3-NITROGEN (AMMONIA) |

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

| | | | |
|---|---|---|---|
| **NH3-F-VA** | Water | Ammonia in Water by Fluorescence | J. ENVIRON. MONIT., 2005, 7, 37-42, RSC |

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

| | | | |
|---|---|---|---|
| **NO2-L-IC-N-WR** | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

| | | | |
|---|---|---|---|
| **NO3-L-IC-N-WR** | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

| | | | |
|---|---|---|---|
| **P-T-PRES-COL-VA** | Water | Total P in Water by Colour | APHA 4500-P Phosphorus |

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

| | | | |
|---|---|---|---|
| **PH-PCT-VA** | Water | pH by Meter (Automated) | APHA 4500-H "pH Value" |

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

| | | | |
|---|---|---|---|
| **PH-PCT-VA** | Water | pH by Meter (Automated) | APHA 4500-H pH Value |

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

| | | | |
|---|---|---|---|
| **S-DIS-ICP-VA** | Water | Dissolved Sulfur in Water by ICPOES | EPA SW-846 3005A/6010B |

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

| | | | |
|---|---|---|---|
| **S-TOT-ICP-VA** | Water | Total Sulfur in Water by ICPOES | EPA SW-846 3005A/6010B |

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

| | | | |
|---|---|---|---|
| **SO4-IC-N-WR** | Water | Sulfate in Water by IC | EPA 300.1 (mod) |

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

| | | | |
|---|---|---|---|
| **TSS-MAN-WR** | Water | Total Suspended Solids by Gravimetric | APHA 2540 D |

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

| Laboratory Definition Code | Laboratory Location |
|---|---|
| ED | ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA |

# Reference Information

| | |
|---|---|
| WR | ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

**Chain of Custody Numbers:**

1 2

**GLOSSARY OF REPORT TERMS**

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*
*mg/kg - milligrams per kilogram based on dry weight of sample.*
*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*
*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*
*mg/L - milligrams per litre.*
*< - Less than.*
*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*
*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*
*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*
*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

Contact: Brent Mack
Company: ALS Laboratory Group
Address: 8081 Lougheed Hwy., Suite 100,
Burnaby, BC V5A 1W9

## REFERENCE DATA

Project / Location: L1785001
PO Number: L1785001
ALS Work Order: 1606743

TEM Water Narrative: Analysis performed on FEI Tecnai TEM with integrated EDXA capabilities. Morphology, EDXA, and SAED measurements used to determine fiber species. Representative EDXA spectra of each asbestos type detected included. Compliance samples must be received and filtered within 48 hours of collection. Collection is performed outside ALS and is the responsibility of the client. Samples disposed after 60 days. TEM grids archived 3 years. Results apply only to portions analyzed.

TEM Water Methods: "EPA 100.2" refers to drinking water samples filtered on 47mm, 0.22µm pore MCE filters. "EPA 100.1" refers to drinking water samples filtered on 47mm, 0.1µm pore Polycarbonate filters. No standard method for asbestos in nonpotable water exists. All TEM waters (potable and nonpotable) analyzed at >10,000x magnification for asbestos fibers >10µm long. Whenever possible, sufficient volume is analyzed to yield an AS of <0.20 MFL based on the detection of 1 confirmed asbestos fiber in the total area analyzed. However, the volume analyzed is dependent upon a filter loading of <25% particulate. Samples containing excessive suspended solids may not reach the recommended AS of <0.20 MFL. In any case, a minimum of 4 and a maximum of 10 openings are analyzed regardless of the AS reached or asbestos concentration detected. ALS will report results directly to state of origin only when;

a) the Chain of Custody clearly states "drinking water for state compliance",
b) the appropriate state drinking water form is submitted with the samples,
c) the state form is completely filled out by the client prior to submittal, and
d) the address to which the form is to be sent is provided.

NOTES: *NA=Not Applicable, ND=None Detected, AS=Analytical Sensitivity, MFL=Millions of Fibers per Liter. † Act-Tremolite concentrations include Actinolite as well as the Libby Amphiboles; Tremolite, Winchite, & Richterite.*

*OH Lab ID: #4077, Ohio Analysts; P. Johnson #2268, A. Sohn #3431*

*PA Lab ID: #68-01320, Cert. #003*

*NELAC accredited through New York ELAP, LAB #11371*

## TEM ANALYSIS DATA

EDXA Resolution (eV): <175
Accelerating Voltage (keV): 100
Prep Start Date: 6/22/2016
Calibration Constant (µm/cm): 0.74
Camera Constant (mm-Å): 129.25
Analysis Start Date: 6/24/2016

Pamela Johnson
ALS TEM Analyst

Shawn Smythe
ALS Project Manager

**IDENTIFICATION**

| | L1785001-16 | L1785001-17 |
|---|---|---|
| Client Sample ID: | E3 | E2 |
| ALS Sample ID: | 1606743-01 | 1606743-02 |
| Method: | EPA 100.2 | EPA 100.2 |
| Date of Collection: | 6/14/2016 | 6/15/2016 |
| Time of Collection: | 10:50 | 10:50 |

**FILTRATION & ANALYSIS**

| | | |
|---|---|---|
| Date of Filtration: | 6/21/2016 | 6/21/2016 |
| Time of Filtration: | 15:20 | 15:20 |
| Volume Filtered (L): | 0.01 | 0.01 |
| Openings Analyzed: | 4 | 4 |
| Avg. Opening Area ($mm^2$): | 0.011 | 0.011 |
| AS (MFL): | 2.44 | 2.44 |

**ASBESTOS COUNT**

| | | |
|---|---|---|
| Chrysotile: | 7 | 3 |
| Amosite: | 0 | 0 |
| Crocidolite: | 0 | 0 |
| Act-Tremolite†: | 0 | 0 |
| Anthophyllite: | 0 | 0 |
| Total Asbestos: | 7 | 3 |

**ASBESTOS CONCENTRATION (MFL)**

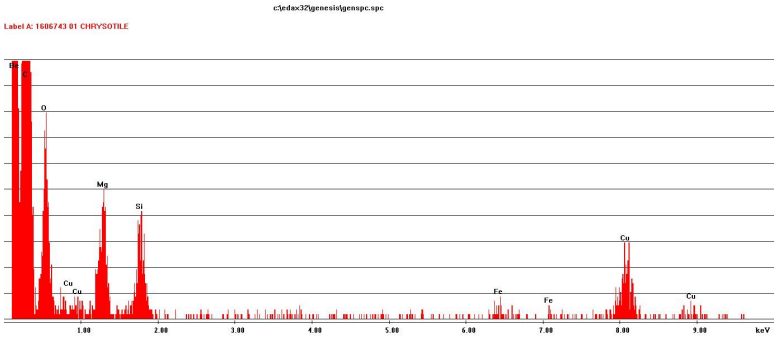
| | | |
|---|---|---|
| Chrysotile: | 17.10 | 7.33 |
| Amosite: | <AS | <AS |
| Crocidolite: | <AS | <AS |
| Act-Tremolite†: | <AS | <AS |
| Anthophyllite: | <AS | <AS |
| **Total Asbestos:** | **17.10** | **7.33** |

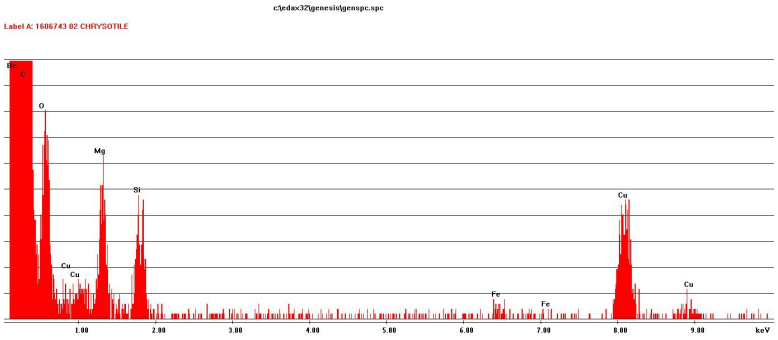
**NOTES**

Samples L1785001-16 E3 and L1785001-17 E2 were received past the method hold time of 48 hours. Both samples contained many additional asbestos structures which were too small to be counted by this method. Analysis was terminated after the completion of the minimum 4 grid openings analyzed per sample.

## EDXA SPECTRA

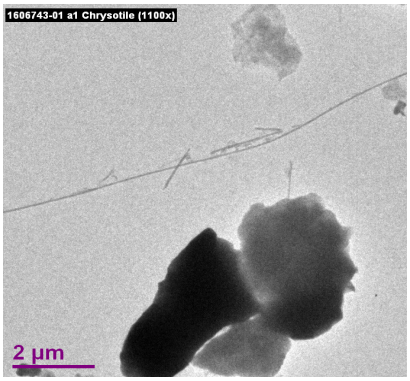
*NOTE: Spurious peaks may originate from low background sample holder, column pole pieces, TEM grids, prep solutions or matrix materials.*

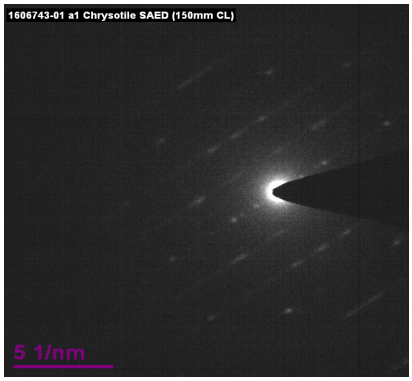


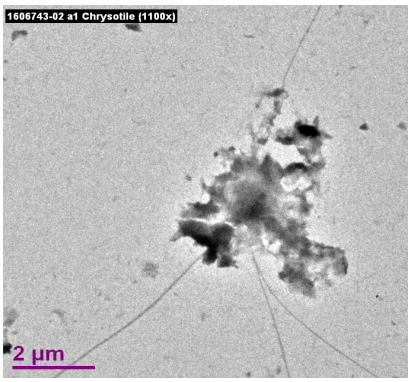




## PHOTOMICROGRAPHS

*Collected using Gatan Digital Micrograph.*




12-Jul-2016

Brent Mack
ALS Laboratory Group
8081 Lougheed Hwy., Suite 100
Burnaby, BC V5A 1W9

Tel: (604) 253-4188
Fax: (604) 253-6700

Re: L1785001 Work Order: **1607133**

Dear Brent,

ALS Environmental received 2 samples on 06-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

# ALS Environmental

Date: 12-Jul-16

**Client:** ALS Laboratory Group
**Project:** L1785001
**Work Order:** **1607133**

## Work Order Sample Summary

| Lab Samp ID | Client Sample ID | Matrix | Tag Number | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| 1607133-01 | L1785001-16 | Water | | 6/14/2016 | 7/6/2016 | ☐ |
| 1607133-02 | L1785001-17 | Water | | 6/15/2016 | 7/6/2016 | ☐ |

## ALS Environmental

*Date: 12-Jul-16*

**Client:** ALS Laboratory Group
**Project:** L1785001
**Work Order:** 1607133

# Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

# ALS Environmental

**Date:** *12-Jul-16*

**Client:** ALS Laboratory Group
**Project:** L1785001 **Work Order:** 1607133
**Sample ID:** L1785001-16 **Lab ID:** 1607133-01
**Collection Date:** 6/14/2016 **Matrix:** WATER

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **TOTAL SUSPENDED SOLIDS BY SM2540 D** | | | **SM2540 D** | | | Analyst: **rmb** |
| **Total suspended solids** | **12** | H | **3.0** | **mg/L** | 1 | 7/8/2016 |

**Note:**

# ALS Environmental

**Date:** *12-Jul-16*

**Client:** ALS Laboratory Group
**Project:** L1785001
**Work Order:** 1607133
**Sample ID:** L1785001-17
**Lab ID:** 1607133-02
**Collection Date:** 6/15/2016
**Matrix:** WATER

| Analyses | Result | Qual | Report Limit | Units | Dilution Factor | Date Analyzed |
|---|---|---|---|---|---|---|
| **TOTAL SUSPENDED SOLIDS BY SM2540 D** | | | **SM2540 D** | | | Analyst: **rmb** |
| **Total suspended solids** | **3.0** | H | **3.0** | **mg/L** | 1 | 7/8/2016 |

**Note:**

ALS Environmental

Date: 12-Jul-16

**Client:** ALS Laboratory Group

**Work Order:** 1607133

**Project:** L1785001

# QC BATCH REPORT

Batch ID: **R130830** Instrument ID: **WETCHEM** Method: **SM2540 D**

**MBLK** Sample ID: **MB-R130830-R130830** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317828** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total suspended solids | ND | 3.0 | | | | | | | | |

**LCS** Sample ID: **LCS-R130830-R130830** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317829** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total suspended solids | 968.8 | 3.0 | 1000 | 0 | 96.9 | 70-130 | 0 | | | |

**DUP** Sample ID: **1607125-01A Dup** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317831** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total suspended solids | 28.37 | 3.0 | 0 | 0 | 0 | | 29.47 | 3.8 | | |

**DUP** Sample ID: **1607210-02A Dup** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317839** Prep Date: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Total suspended solids | 4.25 | 3.0 | 0 | 0 | 0 | | 3.25 | 26.7 | | |

**The following samples were analyzed in this batch:** 1607133-01A 1607133-02A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

# ALS Environmental

Date: 12-Jul-16

**Client:** ALS Laboratory Group
**Project:** L1785001
**WorkOrder:** **1607133**

## QUALIFIERS, ACRONYMS, UNITS

| Qualifier | Description |
|---|---|
| * | Value exceeds Regulatory Limit |
| a | Not accredited |
| B | Analyte detected in the associated Method Blank above the Reporting Limit |
| E | Value above quantitation range |
| H | Analyzed outside of Holding Time |
| J | Analyte detected below quantitation limit |
| n | Not offered for accreditation |
| ND | Not Detected at the Reporting Limit |
| O | Sample amount is > 4 times amount spiked |
| P | Dual Column results percent difference > 40% |
| R | RPD above laboratory control limit |
| S | Spike Recovery outside laboratory control limits |
| U | Analyzed but not detected above the MDL |

| Acronym | Description |
|---|---|
| DUP | Method Duplicate |
| E | EPA Method |
| LCS | Laboratory Control Sample |
| LCSD | Laboratory Control Sample Duplicate |
| MBLK | Method Blank |
| MDL | Method Detection Limit |
| MQL | Method Quantitation Limit |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| PDS | Post Digestion Spike |
| PQL | Practical Quantitaion Limit |
| SDL | Sample Detection Limit |
| SW | SW-846 Method |

| Units Reported | Description |
|---|---|
| mg/L | |

ALS Environmental

## Sample Receipt Checklist

Client Name: **ALS-BURNABY** Date/Time Received: **06-Jul-16 00:00**

Work Order: **1607133** Received by: **RDN**

Checklist completed by: Jan Wilcox 06-Jul-16 Reviewed by: Shawn Smythe 07-Jul-16

eSignature | Date | eSignature | Date

Matrices:

Carrier name: FedEx

| | | | |
|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | Yes ☐ | No ☐ | Not Present ☑ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| Chain of custody present? | Yes ☑ | No ☐ | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | |
| Sample containers intact? | Yes ☑ | No ☐ | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | |
| All samples received within holding time? | Yes ☑ | No ☐ | |
| Container/Temp Blank temperature in compliance? | Yes ☑ | No ☐ | |
| Temperature(s)/Thermometer(s): | 9.4 | | |
| Cooler(s)/Kit(s): | | | |
| Water - VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA vials submitted ☐ |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☐ |
| pH adjusted? | Yes ☐ | No ☐ | N/A ☐ |
| pH adjusted by: | - | | |

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1785001-COFC

COC Number: 1



| Report To | | Report Format / Distribution | Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) |
|---|---|---|---|
| Company: | Hemmera Environchem Inc. | Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL) | R ☑ Regular (Standard TAT if received by 3 pm - business days) |
| Contact: | Natasha Sandys | Quality Control (QC) Report with Report ☑ Yes ☐ No | P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT |
| Address: | 230 - 2237 2nd Avenue<br>Whitehorse, YT | ☐ Criteria on Report - provide details below if box checked | E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT |
| | | Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX | E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge |
| Phone: | 867-456-4885 | Email 1 or Fax nsandys@hemmera.com | Specify Date Required for E2,E or P: |
| | | Email 2 chris@elr.ca | |

| Invoice To | Same as Report To ☑ Yes ☐ No | Invoice Distribution |
|---|---|---|
| | Copy of Invoice with Report ☐ Yes ☑ No | Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX |
| Company: | Hemmera Environchem Inc. | Email 1 or Fax nsandys@hemmera.com |
| Contact: | Natasha Sandys | Email 2 chris@elr.ca |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Quote #: | Q56044 | Approver ID: | Cost Center: |
| Job #: | 1343-005.17 | GL Account: | Routing Code: |
| PO / AFE: | | Activity Code: | |
| LSD: | | Location: | |
| ALS Lab Work Order # (lab use only) | | ALS Contact: | Sampler: AN/CH |

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | F/P Low Level Diss. Met (incl. Hg) and Hardness | P Low Level Tot. Met (incl. Hg) and Hardness | P Chromium Speciation (III/VI) - Total | F/P Chromium Speciation (III/VI) - Dissolved | P Ammonia - N | F/P Dissolved Organic Carbon (DOC) | Nitrate-N | Nitrite - N | Total Phosphorus | Sulphate | pH, Conductivity, Total Susp Solids | | | Number of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FB1 | 14-Jun-16 | 14:45 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | E1 | 14-Jun-16 | 14:45 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | Dup01 | 14-Jun-16 | 14:45 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | E1(H) | 14-Jun-16 | 14:00 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | Travel Blank | | | Water | | R | | | R | R | R | R | R | R | R | | | 6 |
| | E8 | 16-Jun-16 | 15:30 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | E7 | 15-Jun-16 | 14:13 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | Dup02 | 15-Jun-16 | 14:13 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | E4 | 15-Jun-16 | 14:13 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | R4 | 15-Jun-16 | 12:00 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | GWCC-4 | 16-Jun-16 | 9:40 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | GWCC-1 | 15-Jun-16 | 8:30 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |

| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report (client use) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ Yes ☑ No<br>Are samples for human drinking water use? ☐ Yes ☑ No | Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results. |

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☑ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

| INITIAL COOLER TEMPERATURES °C | | | FINAL COOLER TEMPERATURES °C | | |
|---|---|---|---|---|---|
| 5.2 5.4 | 6.1 | 5.7 | 5.4.8 | 5.4.5 | 10°C |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: C. Jestrabek | Date: 17-Jun-16 | Time: 09:40 | Received by: | Date: 17 JUN 16 | Time: 9:45 | Received by: JC | Date: 21 JUN | Time: 13:25 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY



1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1785001-COFC

COC Number: 1



| Report To | | Report Format / Distribution | | Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) |
|---|---|---|---|---|
| Company: | Hemmera Envirochem Inc. | Select Report Format: | ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL) | R ☑ Regular (Standard TAT if received by 3 pm - business days) |
| Contact: | Natasha Sandys | Quality Control (QC) Report with Report | ☑ Yes ☐ No | P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT |
| Address: | 230 - 2237 2nd Avenue<br>Whitehorse, YT | ☐ Criteria on Report - provide details below if box checked | | E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT |
| | | Select Distribution: | ☑ EMAIL ☐ MAIL ☐ FAX | E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge |
| Phone: | 867-456-4865 | Email 1 or Fax | nsandys@hemmera.com | Specify Date Required for E2, E or P: |
| | | Email 2 | chris@elr.ca | |

| Invoice To | Same as Report To | ☑ Yes ☐ No | Invoice Distribution | | |
|---|---|---|---|---|---|
| | Copy of Invoice with Report | ☐ Yes ☑ No | Select Invoice Distribution: | ☑ EMAIL ☑ MAIL ☐ FAX | |
| Company: | Hemmera Envirochem Inc. | | Email 1 or Fax | nsandys@hemmera.com | |
| Contact: | Natasha Sandys | | Email 2 | chris@elr.ca | |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Quote #: | Q56044 | Approver ID: | Cost Center: |
| Job #: | 1343-005.17 | GL Account: | Routing Code: |
| PO / AFE: | | Activity Code: | |
| LSD: | | Location: | |
| ALS Lab Work Order # (lab use only) | | ALS Contact: | Sampler: AN/CH |

**Analysis Request**

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

| ALS Sample # (lab use only) | Sample Identification and/or Coordinates (This description will appear on the report) | Date (dd-mmm-yy) | Time (hh:mm) | Sample Type | F/P Low Level Diss. Met (incl. Hg) and Hardness | P Low Level Tot. Met (incl. Hg) and Hardness | P Chromium Speciation (III/VI) - Total | F/P Chromium Speciation (III/VI) - Dissolved | P Ammonia - N | F/P Dissolved Organic Carbon (DOC) | Nitrate-N | Nitrite - N | Total Phosphorus | Sulphate | pH, Conductivity, Total Susp Solids | Asbestos-TEM-AD | | Number of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWCC-3 | 15-Jun-16 | 9:15 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | GWCC-2 | 15-Jun-16 | 9:00 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | GWCC-5 | 14-Jun-16 | 16:10 | Water | R | R | | | R | R | R | R | R | R | R | | | 9 |
| | E3 | 14-Jun-16 | 17:00 | Water | R | R | | | R | R | R | R | R | R | R | R | | 10 |
| | E2 | 16-Jun-16 | 10:20 | Water | R | R | | | R | R | R | R | R | R | R | R | | 10 |
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| Drinking Water (DW) Samples[1] (client use) | Special Instructions / Specify Criteria to add on report (client use) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ Yes ☑ No | Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results. |
| Are samples for human drinking water use? ☐ Yes ☑ No | |

**SAMPLE CONDITION AS RECEIVED (lab use only)**

| Frozen | ☐ | SIF Observations | Yes ☐ | No ☐ |
|---|---|---|---|---|
| Ice packs | Yes ☑ | No ☐ | Custody seal intact | Yes ☐ No ☐ |
| Cooling Initiated | ☑ | | | |

| INITIAL COOLER TEMPERATURES °C | | | FINAL COOLER TEMPERATURES °C | | |
|---|---|---|---|---|---|
| 5.2, 5.4 | 6.1 | 5.7 | 5, 4, 8 | 8, 4.5 | 10.1 |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: C. Jostadski | Date: 17-Jun-16 | Time: 09:40 | Received by: | Date: 17-Jun-16 | Time: 9:45 | Received by: JC | Date: 21 JUN | Time: 13:25 |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.