ENVIRONMENTAL DYNAMICS INC.
ATTN: Meighan Kearns
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Date Received: 29-MAY-14
Report Date: 10-JUN-14 14:48 (MT)
Version: FINAL

Client Phone: 867-393-4882

# Certificate of Analysis

**Lab Work Order #: L1462103**

Project P.O. #: NOT SUBMITTED
Job Reference: 14-Y-270
C of C Numbers: 1, 2
Legal Site Desc:

Can Dang
Senior Account Manager

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-1 | L1462103-2 | L1462103-3 | L1462103-4 | L1462103-5 |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | Grab | Grab | Grab |
| | Sampled Date | 26-MAY-14 | | 26-MAY-14 | 26-MAY-14 | 26-MAY-14 |
| | Sampled Time | 17:45 | | 14:55 | 14:30 | 15:15 |
| | Client ID | FIELD BLANK | TRAVEL BLANK | NF2-A | X3A | NF2 |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Physical Tests** | Conductivity (uS/cm) | <2.0 | <2.0 | 101 | 134 | 110 |
| | Hardness (as CaCO3) (mg/L) | <0.50 | <0.50 | 46.7 | 61.0 | 52.6 |
| | pH (pH) | 5.61 | 5.61 | 7.34 | 7.56 | 7.42 |
| | Total Suspended Solids (mg/L) | <1.0 | <1.0 | 4.0 | 3.4 | 3.8 |
| | Total Dissolved Solids (mg/L) | <1.0 | <1.0 | 60.8 | 79.2 | 67.7 |
| **Anions and Nutrients** | Alkalinity, Total (as CaCO3) (mg/L) | <2.0 | <2.0 | 46.9 | 61.9 | 46.5 |
| | Ammonia, Total (as N) (mg/L) | <0.0050 | <0.0050 | 0.0053 | 0.0051 | 0.0052 |
| | Chloride (Cl) (mg/L) | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Fluoride (F) (mg/L) | <0.020 | <0.020 | 0.072 | 0.083 | 0.079 |
| | Nitrate (as N) (mg/L) | <0.0050 | <0.0050 | 0.0384 | 0.0523 | 0.0403 |
| | Nitrite (as N) (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | <0.0020 | <0.0020 | 0.0073 | 0.0085 | 0.0082 |
| | Sulfate (SO4) (mg/L) | <0.50 | <0.50 | 7.58 | 11.9 | 12.0 |
| | Anion Sum (meq/L) | <0.10 | <0.10 | 1.10 | 1.49 | 1.19 |
| | Cation Sum (meq/L) | <0.10 | <0.10 | 1.02 | 1.31 | 1.15 |
| | Cation - Anion Balance (%) | 0.0 | 0.0 | -3.9 | -6.5 | -1.3 |
| **Organic / Inorganic Carbon** | Dissolved Organic Carbon (mg/L) | <0.50 | | 6.31 | 5.39 | 6.22 |
| | Total Organic Carbon (mg/L) | <0.50 | <0.50 | 5.86 | 5.59 | 6.20 |
| **Total Metals** | Aluminum (Al)-Total (mg/L) | <0.0030 | <0.0030 | 0.142 | 0.103 | 0.155 |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | 0.00013 |
| | Arsenic (As)-Total (mg/L) | <0.00010 | <0.00010 | 0.00061 | 0.00051 | 0.00061 |
| | Barium (Ba)-Total (mg/L) | <0.000050 | <0.000050 | 0.0328 | 0.0336 | 0.0320 |
| | Beryllium (Be)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Bismuth (Bi)-Total (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Boron (B)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Cadmium (Cd)-Total (mg/L) | <0.000010 | <0.000010 | 0.000044 | 0.000065 | 0.000297 |
| | Calcium (Ca)-Total (mg/L) | <0.020 | <0.020 | 13.7 | 17.3 | 13.6 |
| | Chromium (Cr)-Total (mg/L) | <0.00010 | <0.00010 | 0.00033 | 0.00027 | 0.00037 |
| | Cobalt (Co)-Total (mg/L) | <0.00010 | <0.00010 | 0.00025 | 0.00036 | 0.00167 |
| | Copper (Cu)-Total (mg/L) | <0.00050 | <0.00050 | 0.00149 | 0.00124 | 0.00152 |
| | Iron (Fe)-Total (mg/L) | <0.010 | <0.010 | 0.312 | 0.278 | 0.347 |
| | Lead (Pb)-Total (mg/L) | <0.000050 | <0.000050 | 0.00192 | 0.00118 | 0.00191 |
| | Lithium (Li)-Total (mg/L) | <0.00050 | <0.00050 | 0.00158 | 0.00134 | 0.00222 |
| | Magnesium (Mg)-Total (mg/L) | <0.0050 | <0.0050 | 2.94 | 4.04 | 3.82 |
| | Manganese (Mn)-Total (mg/L) | <0.000050 | <0.000050 | 0.0201 | 0.0330 | 0.0922 |
| | Molybdenum (Mo)-Total (mg/L) | 0.000062 RRV | <0.000050 | 0.000325 | 0.000297 | 0.000279 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1462103-6 Grab 26-MAY-14 15:05 NF2-B | L1462103-7 Grab 26-MAY-14 14:45 X2 | L1462103-8 Grab 26-MAY-14 15:45 NF1 | L1462103-9 Grab 26-MAY-14 14:10 X10-R | L1462103-10 Grab 26-MAY-14 14:10 X10 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Physical Tests** | Conductivity (uS/cm) | 98.9 | 108 | 117 | 152 | 151 |
| | Hardness (as CaCO3) (mg/L) | 46.0 | 48.9 | 49.5 | 68.1 | 69.0 |
| | pH (pH) | 7.34 | 7.50 | 7.39 | 7.73 | 7.75 |
| | Total Suspended Solids (mg/L) | 4.6 | 4.2 | 5.2 | 3.2 | 3.8 |
| | Total Dissolved Solids (mg/L) | 59.5 | 63.2 | 68.1 | 87.5 | 86.5 |
| **Anions and Nutrients** | Alkalinity, Total (as CaCO3) (mg/L) | 45.5 | 45.9 | 45.9 | 71.2 | 68.5 |
| | Ammonia, Total (as N) (mg/L) | <0.0050 | 0.0058 | 0.0068 | 0.0058 | 0.0053 |
| | Chloride (Cl) (mg/L) | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 |
| | Fluoride (F) (mg/L) | 0.073 | 0.077 | 0.075 | 0.081 | 0.086 |
| | Nitrate (as N) (mg/L) | 0.0384 | 0.0359 | 0.0322 | 0.0364 | 0.0368 |
| | Nitrite (as N) (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | 0.0098 | 0.0077 | 0.0123 | 0.0065 | 0.0066 |
| | Sulfate (SO4) (mg/L) | 7.25 | 9.53 | 13.7 | 12.5 | 12.6 |
| | Anion Sum (meq/L) | 1.07 | 1.12 | 1.21 | 1.69 | 1.64 |
| | Cation Sum (meq/L) | 1.00 | 1.07 | 1.08 | 1.45 | 1.47 |
| | Cation - Anion Balance (%) | -3.2 | -2.5 | -5.5 | -7.7 | -5.5 |
| **Organic / Inorganic Carbon** | Dissolved Organic Carbon (mg/L) | 5.97 | 6.09 | 6.25 | 5.55 | 5.58 |
| | Total Organic Carbon (mg/L) | 6.10 | 6.09 | 6.66 | 5.68 | 5.91 |
| **Total Metals** | Aluminum (Al)-Total (mg/L) | 0.166 | 0.156 | 0.194 | 0.134 | 0.119 |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Arsenic (As)-Total (mg/L) | 0.00062 | 0.00062 | 0.00096 | 0.00047 | 0.00052 |
| | Barium (Ba)-Total (mg/L) | 0.0326 | 0.0328 | 0.0444 | 0.0367 | 0.0373 |
| | Beryllium (Be)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Bismuth (Bi)-Total (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Boron (B)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Cadmium (Cd)-Total (mg/L) | 0.000025 | 0.000110 | 0.000046 | 0.000053 | 0.000054 |
| | Calcium (Ca)-Total (mg/L) | 13.6 | 13.9 | 15.1 | 20.0 | 20.2 |
| | Chromium (Cr)-Total (mg/L) | 0.00041 | 0.00033 | 0.00045 | 0.00039 | 0.00036 |
| | Cobalt (Co)-Total (mg/L) | 0.00016 | 0.00060 | 0.00060 | 0.00029 | 0.00030 |
| | Copper (Cu)-Total (mg/L) | 0.00155 | 0.00149 | 0.00191 | 0.00129 | 0.00135 |
| | Iron (Fe)-Total (mg/L) | 0.339 | 0.321 | 0.519 | 0.310 | 0.328 |
| | Lead (Pb)-Total (mg/L) | 0.00236 | 0.00203 | 0.00274 | 0.00101 | 0.00116 |
| | Lithium (Li)-Total (mg/L) | 0.00128 | 0.00159 | 0.00165 | 0.00159 | 0.00158 |
| | Magnesium (Mg)-Total (mg/L) | 2.78 | 3.20 | 3.97 | 5.12 | 4.90 |
| | Manganese (Mn)-Total (mg/L) | 0.0174 | 0.0427 | 0.175 | 0.0258 | 0.0284 |
| | Molybdenum (Mo)-Total (mg/L) | 0.000298 | 0.000317 | 0.000336 | 0.000371 | 0.000381 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-11 | L1462103-12 | | | |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | | | |
| | Sampled Date | 26-MAY-14 | 26-MAY-14 | | | |
| | Sampled Time | 13:55 | 16:00 | | | |
| | Client ID | X14 | R10 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Physical Tests** | Conductivity (uS/cm) | 251 | 101 | | | |
| | Hardness (as CaCO3) (mg/L) | 117 | 45.1 | | | |
| | pH (pH) | 7.75 | 7.48 | | | |
| | Total Suspended Solids (mg/L) | 3.0 | 5.0 | | | |
| | Total Dissolved Solids (mg/L) | 153 | 58.6 | | | |
| **Anions and Nutrients** | Alkalinity, Total (as CaCO3) (mg/L) | 77.8 | 44.7 | | | |
| | Ammonia, Total (as N) (mg/L) | 0.0257 | 0.0055 | | | |
| | Chloride (Cl) (mg/L) | <0.50 | <0.50 | | | |
| | Fluoride (F) (mg/L) | 0.086 | 0.071 | | | |
| | Nitrate (as N) (mg/L) | 0.0575 | 0.0338 | | | |
| | Nitrite (as N) (mg/L) | <0.0010 | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0027 | 0.0105 | | | |
| | Sulfate (SO4) (mg/L) | 54.3 | 6.98 | | | |
| | Anion Sum (meq/L) | 2.69 | 1.04 | | | |
| | Cation Sum (meq/L) | 2.51 | 0.98 | | | |
| | Cation - Anion Balance (%) | -3.6 | -3.0 | | | |
| **Organic / Inorganic Carbon** | Dissolved Organic Carbon (mg/L) | 5.47 | 5.97 | | | |
| | Total Organic Carbon (mg/L) | 5.52 | 6.25 | | | |
| **Total Metals** | Aluminum (Al)-Total (mg/L) | 0.0961 | 0.215 | | | |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | <0.00010 | | | |
| | Arsenic (As)-Total (mg/L) | 0.00054 | 0.00060 | | | |
| | Barium (Ba)-Total (mg/L) | 0.0369 | 0.0333 | | | |
| | Beryllium (Be)-Total (mg/L) | <0.00010 | <0.00010 | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.00050 | <0.00050 | | | |
| | Boron (B)-Total (mg/L) | <0.010 | <0.010 | | | |
| | Cadmium (Cd)-Total (mg/L) | 0.000056 | 0.000024 | | | |
| | Calcium (Ca)-Total (mg/L) | 35.2 | 13.0 | | | |
| | Chromium (Cr)-Total (mg/L) | 0.00032 | 0.00043 | | | |
| | Cobalt (Co)-Total (mg/L) | 0.00131 | 0.00015 | | | |
| | Copper (Cu)-Total (mg/L) | 0.00130 | 0.00145 | | | |
| | Iron (Fe)-Total (mg/L) | 0.318 | 0.369 | | | |
| | Lead (Pb)-Total (mg/L) | 0.00104 | 0.00204 | | | |
| | Lithium (Li)-Total (mg/L) | 0.00232 | 0.00260 | | | |
| | Magnesium (Mg)-Total (mg/L) | 8.01 | 2.80 | | | |
| | Manganese (Mn)-Total (mg/L) | 0.852 | 0.0174 | | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.000381 | 0.000312 | | | |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-1 | L1462103-2 | L1462103-3 | L1462103-4 | L1462103-5 |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | Grab | Grab | Grab |
| | Sampled Date | 26-MAY-14 | | 26-MAY-14 | 26-MAY-14 | 26-MAY-14 |
| | Sampled Time | 17:45 | | 14:55 | 14:30 | 15:15 |
| | Client ID | FIELD BLANK | TRAVEL BLANK | NF2-A | X3A | NF2 |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Total Metals** | Nickel (Ni)-Total (mg/L) | <0.00050 | <0.00050 | 0.00106 | 0.00114 | 0.00308 |
| | Phosphorus (P)-Total (mg/L) | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 |
| | Potassium (K)-Total (mg/L) | <0.050 | <0.050 | 0.687 | 0.767 | 0.691 |
| | Selenium (Se)-Total (mg/L) | <0.00010 | <0.00010 | 0.00020 | 0.00021 | 0.00023 |
| | Silicon (Si)-Total (mg/L) | <0.050 | <0.050 | 4.20 | 3.76 | 4.41 |
| | Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Total (mg/L) | <0.050 | <0.050 | 1.32 | 1.39 | 1.43 |
| | Strontium (Sr)-Total (mg/L) | <0.00020 | <0.00020 | 0.0658 | 0.0876 | 0.0609 |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | 0.00152 |
| | Titanium (Ti)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Total (mg/L) | <0.000010 | <0.000010 | 0.000592 | 0.000884 | 0.000567 |
| | Vanadium (V)-Total (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | <0.0030 | 0.0401 | 0.0694 | 0.389 |
| | Zirconium (Zr)-Total (mg/L) | <0.00080 | <0.00080 | <0.00080 | <0.00080 | <0.00080 |
| **Dissolved Metals** | Dissolved Metals Filtration Location | FIELD | | FIELD | FIELD | FIELD |
| | Aluminum (Al)-Dissolved (mg/L) | <0.0010 | | 0.0335 | 0.0239 | 0.0363 |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | | <0.00010 | <0.00010 | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | <0.00010 | | 0.00043 | 0.00039 | 0.00047 |
| | Barium (Ba)-Dissolved (mg/L) | <0.000050 | | 0.0306 | 0.0340 | 0.0302 |
| | Beryllium (Be)-Dissolved (mg/L) | <0.00010 | | <0.00010 | <0.00010 | <0.00010 |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.00050 | | <0.00050 | <0.00050 | <0.00050 |
| | Boron (B)-Dissolved (mg/L) | <0.010 | | <0.010 | <0.010 | <0.010 |
| | Cadmium (Cd)-Dissolved (mg/L) | <0.000010 | | 0.000039 | 0.000059 | 0.000291 |
| | Calcium (Ca)-Dissolved (mg/L) | <0.020 | | 13.9 | 17.7 | 15.0 |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | 0.00010 | <0.00010 | <0.00010 |
| | Cobalt (Co)-Dissolved (mg/L) | <0.00010 | | 0.00014 | 0.00028 | 0.00157 |
| | Copper (Cu)-Dissolved (mg/L) | <0.00020 | | 0.00112 | 0.00100 | 0.00120 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | | 0.101 | 0.119 | 0.138 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | | 0.000778 | 0.000485 | 0.000833 |
| | Lithium (Li)-Dissolved (mg/L) | <0.00050 | | 0.00185 | 0.00140 | 0.00203 |
| | Magnesium (Mg)-Dissolved (mg/L) | <0.0050 | | 2.90 | 4.11 | 3.70 |
| | Manganese (Mn)-Dissolved (mg/L) | <0.000050 | | 0.0118 | 0.0266 | 0.0861 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000054 RRV | | 0.000299 | 0.000279 | 0.000278 |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | | 0.00089 | 0.00095 | 0.00287 |
| | Phosphorus (P)-Dissolved (mg/L) | <0.30 | | <0.30 | <0.30 | <0.30 |
| | Potassium (K)-Dissolved (mg/L) | <0.050 | | 0.655 | 0.765 | 0.668 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1462103-6 Grab 26-MAY-14 15:05 NF2-B | L1462103-7 Grab 26-MAY-14 14:45 X2 | L1462103-8 Grab 26-MAY-14 15:45 NF1 | L1462103-9 Grab 26-MAY-14 14:10 X10-R | L1462103-10 Grab 26-MAY-14 14:10 X10 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Total Metals** | Nickel (Ni)-Total (mg/L) | 0.00099 | 0.00161 | 0.00148 | 0.00128 | 0.00131 |
| | Phosphorus (P)-Total (mg/L) | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 |
| | Potassium (K)-Total (mg/L) | 0.657 | 0.697 | 0.839 | 0.749 | 0.751 |
| | Selenium (Se)-Total (mg/L) | 0.00020 | 0.00020 | 0.00022 | 0.00023 | 0.00024 |
| | Silicon (Si)-Total (mg/L) | 4.05 | 4.14 | 4.28 | 3.75 | 3.80 |
| | Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | 0.000013 | <0.000010 | <0.000010 |
| | Sodium (Na)-Total (mg/L) | 1.27 | 1.33 | 1.53 | 1.30 | 1.30 |
| | Strontium (Sr)-Total (mg/L) | 0.0635 | 0.0673 | 0.0686 | 0.0930 | 0.0935 |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Total (mg/L) | 0.000588 | 0.000600 | 0.000643 | 0.000946 | 0.000965 |
| | Vanadium (V)-Total (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Zinc (Zn)-Total (mg/L) | 0.0079 | 0.118 | 0.0330 | 0.0597 | 0.0609 |
| | Zirconium (Zr)-Total (mg/L) | <0.00080 | <0.00080 | <0.00080 | <0.00080 | <0.00080 |
| **Dissolved Metals** | Dissolved Metals Filtration Location | FIELD | FIELD | FIELD | FIELD | FIELD |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0320 | 0.0345 | 0.0358 | 0.0222 | 0.0237 |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | 0.00045 | 0.00045 | 0.00057 | 0.00035 | 0.00036 |
| | Barium (Ba)-Dissolved (mg/L) | 0.0301 | 0.0305 | 0.0333 | 0.0353 | 0.0355 |
| | Beryllium (Be)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Boron (B)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Cadmium (Cd)-Dissolved (mg/L) | 0.000015 | 0.000096 | 0.000024 | 0.000045 | 0.000044 |
| | Calcium (Ca)-Dissolved (mg/L) | 13.8 | 14.3 | 14.5 | 19.1 | 19.3 |
| | Chromium (Cr)-Dissolved (mg/L) | 0.00011 | 0.00011 | 0.00012 | 0.00010 | <0.00010 |
| | Cobalt (Co)-Dissolved (mg/L) | <0.00010 | 0.00049 | 0.00030 | 0.00019 | 0.00020 |
| | Copper (Cu)-Dissolved (mg/L) | 0.00110 | 0.00114 | 0.00110 | 0.00106 | 0.00105 |
| | Iron (Fe)-Dissolved (mg/L) | 0.096 | 0.115 | 0.197 | 0.119 | 0.120 |
| | Lead (Pb)-Dissolved (mg/L) | 0.000797 | 0.000779 | 0.000962 | 0.000433 | 0.000452 |
| | Lithium (Li)-Dissolved (mg/L) | 0.00163 | 0.00198 | 0.00179 | 0.00167 | 0.00180 |
| | Magnesium (Mg)-Dissolved (mg/L) | 2.80 | 3.22 | 3.26 | 4.96 | 5.03 |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00639 | 0.0341 | 0.105 | 0.0197 | 0.0198 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000295 | 0.000307 | 0.000315 | 0.000351 | 0.000346 |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00060 | 0.00127 | 0.00087 | 0.00103 | 0.00098 |
| | Phosphorus (P)-Dissolved (mg/L) | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 |
| | Potassium (K)-Dissolved (mg/L) | 0.639 | 0.668 | 0.665 | 0.723 | 0.755 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-11 | L1462103-12 | | | |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | | | |
| | Sampled Date | 26-MAY-14 | 26-MAY-14 | | | |
| | Sampled Time | 13:55 | 16:00 | | | |
| | Client ID | X14 | R10 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Total Metals** | Nickel (Ni)-Total (mg/L) | 0.00238 | 0.00091 | | | |
| | Phosphorus (P)-Total (mg/L) | <0.30 | <0.30 | | | |
| | Potassium (K)-Total (mg/L) | 0.962 | 0.642 | | | |
| | Selenium (Se)-Total (mg/L) | 0.00021 | 0.00016 | | | |
| | Silicon (Si)-Total (mg/L) | 3.88 | 4.15 | | | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | 2.11 | 1.26 | | | |
| | Strontium (Sr)-Total (mg/L) | 0.141 | 0.0614 | | | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | <0.000010 | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | 0.00117 | 0.000603 | | | |
| | Vanadium (V)-Total (mg/L) | <0.0010 | <0.0010 | | | |
| | Zinc (Zn)-Total (mg/L) | 0.0571 | 0.0061 | | | |
| | Zirconium (Zr)-Total (mg/L) | <0.00080 | <0.00080 | | | |
| **Dissolved Metals** | Dissolved Metals Filtration Location | FIELD | FIELD | | | |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0218 | 0.0389 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | <0.00010 | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00035 | 0.00042 | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.0349 | 0.0297 | | | |
| | Beryllium (Be)-Dissolved (mg/L) | <0.00010 | <0.00010 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.00050 | <0.00050 | | | |
| | Boron (B)-Dissolved (mg/L) | <0.010 | <0.010 | | | |
| | Cadmium (Cd)-Dissolved (mg/L) | 0.000052 | 0.000014 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 34.0 | 13.5 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | 0.00011 | | | |
| | Cobalt (Co)-Dissolved (mg/L) | 0.00121 | <0.00010 | | | |
| | Copper (Cu)-Dissolved (mg/L) | 0.00100 | 0.00101 | | | |
| | Iron (Fe)-Dissolved (mg/L) | 0.158 | 0.091 | | | |
| | Lead (Pb)-Dissolved (mg/L) | 0.000403 | 0.00104 | | | |
| | Lithium (Li)-Dissolved (mg/L) | 0.00320 | 0.00262 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 7.92 | 2.77 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.835 | 0.00900 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000366 | 0.000281 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00201 | 0.00057 | | | |
| | Phosphorus (P)-Dissolved (mg/L) | <0.30 | <0.30 | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.941 | 0.605 | | | |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| Grouping | Analyte | L1462103-1 Grab 26-MAY-14 17:45 FIELD BLANK | L1462103-2 Grab TRAVEL BLANK | L1462103-3 Grab 26-MAY-14 14:55 NF2-A | L1462103-4 Grab 26-MAY-14 14:30 X3A | L1462103-5 Grab 26-MAY-14 15:15 NF2 |
|---|---|---|---|---|---|---|
| **WATER** | | | | | | |
| **Dissolved Metals** | Selenium (Se)-Dissolved (mg/L) | <0.00010 | | 0.00017 | 0.00018 | 0.00020 |
| | Silicon (Si)-Dissolved (mg/L) | <0.050 | | 4.02 | 3.82 | 4.01 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | <0.050 | | 1.30 | 1.39 | 1.35 |
| | Strontium (Sr)-Dissolved (mg/L) | <0.00020 | | 0.0635 | 0.0847 | 0.0656 |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | <0.000010 | | 0.000571 | 0.000865 | 0.000563 |
| | Vanadium (V)-Dissolved (mg/L) | <0.0010 | | <0.0010 | <0.0010 | <0.0010 |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | | 0.0360 | 0.0684 | 0.394 |
| | Zirconium (Zr)-Dissolved (mg/L) | <0.00080 | | <0.00080 | <0.00080 | <0.00080 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-6 | L1462103-7 | L1462103-8 | L1462103-9 | L1462103-10 |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | Grab | Grab | Grab |
| | Sampled Date | 26-MAY-14 | 26-MAY-14 | 26-MAY-14 | 26-MAY-14 | 26-MAY-14 |
| | Sampled Time | 15:05 | 14:45 | 15:45 | 14:10 | 14:10 |
| | Client ID | NF2-B | X2 | NF1 | X10-R | X10 |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Dissolved Metals** | Selenium (Se)-Dissolved (mg/L) | 0.00018 | 0.00019 | 0.00020 | 0.00022 | 0.00023 |
| | Silicon (Si)-Dissolved (mg/L) | 4.02 | 4.02 | 4.21 | 3.63 | 3.73 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | 1.27 | 1.33 | 1.29 | 1.31 | 1.33 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.0631 | 0.0647 | 0.0667 | 0.0920 | 0.0930 |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | 0.000554 | 0.000573 | 0.000597 | 0.000924 | 0.000947 |
| | Vanadium (V)-Dissolved (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0058 | 0.116 | 0.0194 | 0.0567 | 0.0595 |
| | Zirconium (Zr)-Dissolved (mg/L) | <0.00080 | <0.00080 | <0.00080 | <0.00080 | <0.00080 |

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

# ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L1462103-11 | L1462103-12 | | | |
|---|---|---|---|---|---|---|
| | Description | Grab | Grab | | | |
| | Sampled Date | 26-MAY-14 | 26-MAY-14 | | | |
| | Sampled Time | 13:55 | 16:00 | | | |
| | Client ID | X14 | R10 | | | |
| **Grouping** | **Analyte** | | | | | |
| **WATER** | | | | | | |
| **Dissolved Metals** | Selenium (Se)-Dissolved (mg/L) | 0.00023 | 0.00020 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 4.01 | 4.19 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | 2.08 | 1.28 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.125 | 0.0612 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.00109 | 0.000588 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.0010 | <0.0010 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0538 | 0.0047 | | | |
| | Zirconium (Zr)-Dissolved (mg/L) | <0.00080 | <0.00080 | | | |

* 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 | Cadmium (Cd)-Dissolved | DLM | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Aluminum (Al)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Antimony (Sb)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Cobalt (Co)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Copper (Cu)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Iron (Fe)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Nickel (Ni)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Uranium (U)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Zinc (Zn)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Boron (B)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Molybdenum (Mo)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Total Organic Carbon | MS-B | L1462103-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Dissolved Organic Carbon | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Arsenic (As)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Molybdenum (Mo)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Potassium (K)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Uranium (U)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L1462103-1, -10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Aluminum (Al)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Manganese (Mn)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L1462103-10, -11, -12, -3, -4, -5, -6, -7, -8, -9 |

**Qualifiers for Individual Parameters Listed:**

| Qualifier | Description |
|---|---|
| DLM | Detection Limit Adjusted due to sample matrix effects. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RRV | Reported Result Verified By Repeat Analysis |

# Reference Information

**Test Method References:**

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|---|---|---|
| **ALK-COL-VA** | Water | Alkalinity by Colourimetric (Automated) | EPA 310.2 |
| This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. | | | |
| **ANIONS-CL-IC-WR** | Water | Chloride by Ion Chromatography | EPA 300.1 |
| This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. | | | |
| **ANIONS-F-IC-WR** | Water | Fluoride by Ion Chromatography | EPA 300.1 |
| This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. | | | |
| **ANIONS-NO2-IC-WR** | Water | Nitrite Nitrogen by Ion Chromatography | EPA 300.1 |
| This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance. | | | |
| **ANIONS-NO3-IC-WR** | Water | Nitrate Nitrogen by Ion Chromatography | EPA 300.1 |
| This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance. | | | |
| **ANIONS-SO4-IC-WR** | Water | Sulphate by Ion Chromatography | EPA 300.1 |
| This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. | | | |
| **CARBONS-DOC-VA** | Water | Dissolved organic carbon by combustion | APHA 5310 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 5310 TOTAL ORGANIC CARBON (TOC) |
| This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". | | | |
| **EC-MAN-WR** | Water | Conductivity by Meter | APHA 2510 (B) |
| This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using an 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. | | | |
| **IONBALANCE-VA** | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.<br><br>Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:<br><br>Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| **MET-D-CCMS-VA** | Water | Dissolved Metals in Water by CRC ICPMS | APHA 3030 B&E / EPA SW-846 6020A |
| 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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A). | | | |
| **MET-T-CCMS-VA** | Water | Total Metals in Water by CRC ICPMS | APHA 3030 B&E / EPA SW-846 6020A |
| 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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A). | | | |
| **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. | | | |

# Reference Information

| | | | |
|---|---|---|---|
| **P-T-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-MAN-WR** | Water | pH by Meter | APHA 4500-H (B) |

"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."

| | | | |
|---|---|---|---|
| **TDS-CALC-VA** | Water | TDS (Calculated) | APHA 1030E (20TH EDITION) |

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

| | | | |
|---|---|---|---|
| **TSS-LOW-WR** | Water | Total Suspended Solids by Grav. (1 mg/L) | 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.

| | | | |
|---|---|---|---|
| **ZR-D-MS-VA** | Water | Dissolved Zr in Water by ICPMS | EPA SW-846 3005A/6020A |

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 - mass spectrometry (EPA Method 6020A).

| | | | |
|---|---|---|---|
| **ZR-T-MS-VA** | Water | Total Zr in Water by ICPMS | EPA SW-846 3005A/6020A |

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 - mass spectrometry (EPA Method 6020A).

** 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 |
|---|---|
| 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.*

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1462103-COFC

COC Number: 14 -

Page ___ of ___

| Report To | | Report Format / Distribution | Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) |
|---|---|---|---|
| Company: | EDI | Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL) | R ☑ Regular (Standard TAT if received by 3 pm - business days) |
| Contact: | Meighan Kearns | 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: | 2195 - 2nd Avenue<br>Whitehorse, YT Y1A 3T8 | ☐ 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 |
| Phone: | 867-393-4882 | Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX | E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge |
| | | Email 1 or Fax mkearns@edynamics.com | Specify Date Required for E2,E or P: |
| | | Email 2 adrienne.turcotte@gov.yk.ca | |

| Invoice To | | Invoice Distribution | |
|---|---|---|---|
| | Same as Report To ☐ Yes ☑ No | Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX | |
| | Copy of Invoice with Report ☑ Yes ☐ No | Email 1 or Fax sjenner@edynamics.com | |
| Company: | EDI | Email 2 | |
| Contact: | S Jenner | | |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Quote #: | Q38556 | Approver ID: | Cost Center: |
| Job #: | 14-Y-270 | GL Account: | Routing Code: |
| PO / AFE: | | Activity Code: | |
| LSD: | | Location: | |

| ALS Lab Work Order # (lab use only) | | ALS Contact: | Sampler: BSm ; LG |
|---|---|---|---|

**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 | ALK-COL-VA,P-T-COL-VA,IONBALANCE-V | ANIONS-ALL-IC-WR, TDS-CALC-VA | EC-MAN-WR,PH-MAN-WR | TSS-LOW-WR | CARBONS-TOC-VA,NH3-F-VA | CARBONS-DOC-VA | MET-T-CCMS-VA,ZR-T-MS-VA | MET-D-CCMS-VA,ZR-D-MS-VA | HARDNESS-CALC-VA | Number of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Field Blank | 26 MAY 14 | 17:45 | — | R | R | R | R | R | R | R | R | R | 5 |
| | Travel Blank | — | — | — | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | NF2-A | 26MAY14 | 14:55 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | X3A | 26MAY14 | 14:30 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | NF2 | 26MAY14 | 15:15 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | NF2-B | 26 MAY 14 | 15:05 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | X2 | 26MAY14 | 14:45 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | NF1 | 26MAY14 | 15:45 | GRAB | R | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

| 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 | Use CH2M_EQUIS for EDD. |
| 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 | | |
|---|---|---|---|---|
| 1.0 | 4.0 | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: B. Smi | Date: | Time: | Received by: | Date: 27-May-14 | Time: 9:20 | Received by: | Date: | Time: |

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.

# Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1462103-COFC

COC Number: 14 -

Page ____ of ____

| Report To | | Report Format / L | Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) |
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| Company: | EDI | Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL) | R ☑ Regular (Standard TAT if received by 3 pm - business days) |
| Contact: | Meighan Kearns | 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: | 2195 - 2nd Avenue<br>Whitehorse, YT Y1A 3T8 | ☐ 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: | 867-393-4882 | Email 1 or Fax mkearns@edynamics.com | Specify Date Required for E2,E or P: |
| | | Email 2 adrienne.turcotte@gov.yk.ca | |

| Invoice To | Same as Report To ☐ Yes ☑ No | Invoice Distribution | Analysis Request |
|---|---|---|---|
| | Copy of Invoice with Report ☑ Yes ☐ No | Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX | Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below |
| Company: | EDI | Email 1 or Fax sjenner@edynamics.com | |
| Contact: | S Jenner | Email 2 | |

| Project Information | | Oil and Gas Required Fields (client use) | |
|---|---|---|---|
| ALS Quote #: | Q38556 | Approver ID: | Cost Center: |
| Job #: | 14-Y-270 | GL Account: | Routing Code: |
| PO / AFE: | | Activity Code: | |
| LSD: | | Location: | |

| ALS Lab Work Order # (lab use only) | | ALS Contact: | Sampler: BSm / LG |
|---|---|---|---|

| 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 | ALK-COL-VA,P-T-COL-VA,IONBALANCE-VA | ANIONS-ALL-IC-WR, TDS-CALC-VA | EC-MAN-WR,PH-MAN-WR | TSS-LOW-WR | CARBONS-TOC-VA,NH3-F-VA | CARBONS-DOC-VA | MET-T-CCMS-VA,ZR-T-MS-VA | MET-D-CCMS-VA,ZR-D-MS-VA | HARDNESS-CALC-VA | Number of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | X10-F | 26MAY14 | 14:10 | GRAB | R | R | R | R | R | R | R | R | R | 5 |
| | X10 | 26MAY14 | 14:10 | GRAB | R | | | | | | | | | |
| | X14 | 26MAY14 | 13:55 | GRAB | R | | | | | | | | | |
| | R10 | 26MAY14 | 16:00 | GRAB | R | | | | | | | | | |

| 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 | Use CH2M_EQUIS for EDD. |

| 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 | |
| | | | |

| SHIPMENT RELEASE (client use) | | | INITIAL SHIPMENT RECEPTION (lab use only) | | | FINAL SHIPMENT RECEPTION (lab use only) | | |
|---|---|---|---|---|---|---|---|---|
| Released by: B. Smith | Date: 29MAY14 | Time: | Received by: | Date: | Time: | Received by: | Date: | Time: |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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