TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

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TestAmerica Job ID: 490-164488-1
Client Project/Site: CUF_BS_20181206_2A

For:
Environmental Standards Inc.
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Attn: Jennifer N. Gable

*Authorized for release by:*
*12/17/2018 11:27:41 PM*

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Sample Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Solid | 12/06/18 10:01 | 12/06/18 18:10 |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Solid | 12/06/18 10:26 | 12/06/18 18:10 |
| 490-164488-3 | CUF-BS-FB-14-20181206 | Water | 12/06/18 13:00 | 12/06/18 18:10 |

## Job ID: 490-164488-1

### Laboratory: TestAmerica Nashville

**Narrative**

**Job Narrative**
**490-164488-1**

**Comments**
No additional comments.

**Receipt**
The samples were received on 12/6/2018 6:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0º C.

**HPLC/IC**
Method(s) 9056A: The method blank for analytical batch 490-562242 contained Chloride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

Method(s) 9056, 9056A: Due to the high concentration of Chloride and Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 490-562242 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

Method(s) 9056A: Due to the high concentration of Chloride and Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 490-562165 and analytical batch 490-562319 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

Method(s) 9056A: The method blank for analytical batch 490-562319 contained Chloride and Sulfate above the method detection limit. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**Metals**
Method(s) 6020A: The following samples were diluted to bring the concentration of boron to within the instrument's linear range: (180-84710-E-4-D ^10), (180-84710-E-4-E MS ^10), (180-84710-E-4-F MSD ^10), (180-84710-E-4-D PDS ^10) and (180-84710-E-4-D SD ^50). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**Organic Prep**
Method(s) Moisture: The sample duplicate precision for the following sample associated with analytical batch 490-562643 was outside control limits for Percent Moisture: (490-164472-H-14 DU).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Qualifiers

### HPLC/IC

| Qualifier | Qualifier Description |
|---|---|
| E | Result exceeded calibration range. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| F3 | Duplicate RPD exceeds the control limit |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

# Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Client Sample ID: CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206

**Lab Sample ID: 490-164488-1**

**Date Collected: 12/06/18 10:01**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**
**Percent Solids: 72.0**

### Method: 9056A - Anions, Ion Chromatography - Soluble

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 13.9 | 9.75 | mg/Kg | ☼ | | 12/08/18 03:21 | 1 |
| Fluoride | ND | | 1.39 | 1.11 | mg/Kg | ☼ | | 12/08/18 03:21 | 1 |
| Sulfate | ND | | 13.9 | 8.36 | mg/Kg | ☼ | | 12/08/18 03:21 | 1 |

### Method: EPA 6020A - Metals (ICP/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.569 | | 0.275 | 0.0852 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Arsenic | 20.3 | | 0.137 | 0.0357 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Barium | 59.7 | | 1.37 | 0.0783 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Beryllium | 0.914 | | 0.137 | 0.0103 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Boron | 3.53 | J B | 11.0 | 1.05 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Cadmium | 0.113 | J | 0.137 | 0.0234 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Calcium | 517 | | 68.7 | 12.3 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Chromium | 20.7 | | 0.275 | 0.0907 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Cobalt | 4.15 | | 0.0687 | 0.0114 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Copper | 24.1 | | 0.275 | 0.155 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Lead | 11.8 | | 0.137 | 0.0481 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Lithium | 8.49 | | 0.687 | 0.379 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Molybdenum | 3.10 | | 0.687 | 0.0852 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Nickel | 17.4 | | 0.137 | 0.0838 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Selenium | 0.786 | | 0.687 | 0.0825 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Silver | 0.0577 | J | 0.137 | 0.0192 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Thallium | 0.384 | | 0.137 | 0.0179 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Vanadium | 47.8 | B | 0.137 | 0.0838 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |
| Zinc | 32.3 | | 0.687 | 0.459 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:44 | 1 |

### Method: EPA 7471B - Mercury (CVAA)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0441 | | 0.0436 | 0.0189 | mg/Kg | ☼ | 12/12/18 18:27 | 12/13/18 13:33 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 28.0 | | 0.1 | 0.1 | % | | | 12/10/18 14:06 | 1 |
| Percent Solids | 72.0 | | 0.1 | 0.1 | % | | | 12/10/18 14:06 | 1 |

### General Chemistry - Soluble

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 5.8 | | 0.1 | 0.1 | SU | | | 12/11/18 18:34 | 1 |

# Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Client Sample ID: CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206

**Lab Sample ID: 490-164488-2**

**Date Collected: 12/06/18 10:26**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**
**Percent Solids: 72.9**

### Method: 9056A - Anions, Ion Chromatography - Soluble

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 13.6 | 9.51 | mg/Kg | ☼ | | 12/08/18 03:38 | 1 |
| Fluoride | ND | | 1.36 | 1.09 | mg/Kg | ☼ | | 12/08/18 03:38 | 1 |
| Sulfate | ND | | 13.6 | 8.15 | mg/Kg | ☼ | | 12/08/18 03:38 | 1 |

### Method: EPA 6020A - Metals (ICP/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.639 | | 0.277 | 0.0859 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Arsenic | 16.4 | | 0.139 | 0.0360 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Barium | 67.7 | | 1.39 | 0.0790 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Beryllium | 1.67 | | 0.139 | 0.0104 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Boron | 3.04 | J B | 11.1 | 1.06 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Cadmium | 0.112 | J | 0.139 | 0.0236 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Calcium | 587 | | 69.3 | 12.4 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Chromium | 17.8 | | 0.277 | 0.0914 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Cobalt | 12.0 | | 0.0693 | 0.0115 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Copper | 20.0 | | 0.277 | 0.157 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Lead | 13.8 | | 0.139 | 0.0485 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Lithium | 8.86 | | 0.693 | 0.382 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Molybdenum | 2.24 | | 0.693 | 0.0859 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Nickel | 17.4 | | 0.139 | 0.0845 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Selenium | 1.73 | | 0.693 | 0.0831 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Silver | 0.0726 | J | 0.139 | 0.0194 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Thallium | 0.395 | | 0.139 | 0.0180 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Vanadium | 38.2 | B | 0.139 | 0.0845 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |
| Zinc | 35.6 | | 0.693 | 0.463 | mg/Kg | ☼ | 12/12/18 09:26 | 12/13/18 13:47 | 1 |

### Method: EPA 7471B - Mercury (CVAA)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.213 | | 0.0431 | 0.0187 | mg/Kg | ☼ | 12/12/18 18:27 | 12/13/18 13:34 | 1 |

### General Chemistry

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 27.1 | | 0.1 | 0.1 | % | | | 12/10/18 14:06 | 1 |
| Percent Solids | 72.9 | | 0.1 | 0.1 | % | | | 12/10/18 14:06 | 1 |

### General Chemistry - Soluble

| Analyte | Result | Qualifier | RL | RL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH | 5.5 | | 0.1 | 0.1 | SU | | | 12/11/18 18:34 | 1 |

# Client Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Client Sample ID: CUF-BS-FB-14-20181206

**Lab Sample ID: 490-164488-3**

**Date Collected: 12/06/18 13:00**
**Matrix: Water**
**Date Received: 12/06/18 18:10**

### Method: 9056A - Anions, Ion Chromatography

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **0.208** | **J B** | 1.00 | 0.200 | mg/L | | | 12/07/18 17:08 | 1 |
| Fluoride | ND | | 0.100 | 0.0100 | mg/L | | | 12/07/18 17:08 | 1 |
| **Sulfate** | **0.165** | **J B** | 1.00 | 0.0300 | mg/L | | | 12/07/18 17:08 | 1 |

### Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND | | 0.00200 | 0.00112 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Arsenic | ND | | 0.00100 | 0.000323 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Barium | ND | | 0.0100 | 0.000373 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Beryllium | ND | | 0.00100 | 0.0000570 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Boron | ND | | 0.0800 | 0.0303 | mg/L | | 12/12/18 06:51 | 12/14/18 23:11 | 1 |
| Cadmium | ND | | 0.00100 | 0.000125 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| **Calcium** | **0.136** | **J** | 0.500 | 0.116 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| **Chromium** | **0.00132** | **J** | 0.00200 | 0.000631 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Cobalt | ND | | 0.000500 | 0.0000750 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Copper | ND | | 0.00200 | 0.00130 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Lead | ND | | 0.00100 | 0.0000940 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Lithium | ND | | 0.00500 | 0.00256 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Molybdenum | ND | | 0.00500 | 0.000474 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Nickel | ND | | 0.00100 | 0.000312 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Selenium | ND | | 0.00500 | 0.000813 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| **Silver** | **0.000126** | **J B** | 0.00100 | 0.000121 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Thallium | ND | | 0.00100 | 0.0000630 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| **Vanadium** | **0.00113** | | 0.00100 | 0.000899 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |
| Zinc | ND | | 0.00500 | 0.00242 | mg/L | | 12/12/18 06:51 | 12/13/18 09:19 | 1 |

### Method: EPA 7470A - Mercury (CVAA)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 0.0000653 | mg/L | | 12/12/18 16:06 | 12/13/18 16:12 | 1 |

# QC Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 490-562242/3**
**Matrix: Water**
**Analysis Batch: 562242**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.2232 | J | 1.00 | 0.200 | mg/L | | | 12/07/18 15:45 | 1 |
| Fluoride | ND | | 0.100 | 0.0100 | mg/L | | | 12/07/18 15:45 | 1 |
| Sulfate | 0.2323 | J | 1.00 | 0.0300 | mg/L | | | 12/07/18 15:45 | 1 |

**Lab Sample ID: LCS 490-562242/4**
**Matrix: Water**
**Analysis Batch: 562242**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.484 | | mg/L | | 95 | 80 - 120 |
| Fluoride | 1.00 | 0.9881 | | mg/L | | 99 | 80 - 120 |
| Sulfate | 10.0 | 10.20 | | mg/L | | 102 | 80 - 120 |

**Lab Sample ID: LCSD 490-562242/5**
**Matrix: Water**
**Analysis Batch: 562242**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 10.0 | 9.524 | | mg/L | | 95 | 80 - 120 | 0 | 20 |
| Fluoride | 1.00 | 0.9959 | | mg/L | | 99 | 80 - 120 | 1 | 20 |
| Sulfate | 10.0 | 10.29 | | mg/L | | 103 | 80 - 120 | 1 | 20 |

**Lab Sample ID: 490-164468-B-1 MS**
**Matrix: Water**
**Analysis Batch: 562242**

**Client Sample ID: Matrix Spike**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29.6 | E B F1 | 10.0 | 42.88 | E F1 | mg/L | | 132 | 80 - 120 |
| Fluoride | 0.245 | | 1.00 | 1.260 | | mg/L | | 101 | 80 - 120 |
| Sulfate | 3010 | E B | 10.0 | 3037 | E 4 | mg/L | | 302 | 80 - 120 |

**Lab Sample ID: 490-164468-B-1 MSD**
**Matrix: Water**
**Analysis Batch: 562242**

**Client Sample ID: Matrix Spike Duplicate**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 29.6 | E B F1 | 10.0 | 41.75 | E F1 | mg/L | | 121 | 80 - 120 | 3 | 20 |
| Fluoride | 0.245 | | 1.00 | 1.154 | | mg/L | | 91 | 80 - 120 | 9 | 20 |
| Sulfate | 3010 | E B | 10.0 | 3038 | E 4 | mg/L | | 319 | 80 - 120 | 0 | 20 |

**Lab Sample ID: MRL 490-562319/32**
**Matrix: Solid**
**Analysis Batch: 562319**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 5.00 | 1.116 | | mg/L | | 22 | |
| Fluoride | 0.500 | 0.1128 | | mg/L | | 23 | |
| Sulfate | 5.00 | 1.099 | | mg/L | | 22 | |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 490-562165/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 562319**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | | 10.1 | 7.08 | mg/Kg | | | 12/07/18 21:16 | 1 |
| Fluoride | ND | | 1.01 | 0.809 | mg/Kg | | | 12/07/18 21:16 | 1 |
| Sulfate | ND | | 10.1 | 6.06 | mg/Kg | | | 12/07/18 21:16 | 1 |

**Lab Sample ID: LCS 490-562165/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 562319**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 101 | 97.69 | | mg/Kg | | 97 | 80 - 120 |
| Fluoride | 10.1 | 9.869 | | mg/Kg | | 98 | 80 - 120 |
| Sulfate | 101 | 99.27 | | mg/Kg | | 98 | 80 - 120 |

**Lab Sample ID: LCSD 490-562165/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 562319**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 101 | 96.52 | | mg/Kg | | 95 | 80 - 120 | 1 | 20 |
| Fluoride | 10.1 | 9.707 | | mg/Kg | | 96 | 80 - 120 | 2 | 20 |
| Sulfate | 102 | 98.05 | | mg/Kg | | 97 | 80 - 120 | 1 | 20 |

**Lab Sample ID: 490-164471-A-2-C MS** — **Client Sample ID: Matrix Spike**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 562319**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 246 | E F1 | 119 | 433.2 | E F1 | mg/Kg | ☼ | 157 | 80 - 120 |
| Fluoride | 2.39 | | 11.9 | 11.90 | | mg/Kg | ☼ | 80 | 80 - 120 |
| Sulfate | 1970 | E | 119 | 2197 | E 4 | mg/Kg | ☼ | 193 | 80 - 120 |

**Lab Sample ID: 490-164471-A-2-D MSD** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 562319**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 246 | E F1 | 117 | 399.5 | E F1 | mg/Kg | ☼ | 131 | 80 - 120 | 8 | 20 |
| Fluoride | 2.39 | | 11.7 | 11.77 | | mg/Kg | ☼ | 80 | 80 - 120 | 1 | 20 |
| Sulfate | 1970 | E | 117 | 1825 | E 4 | mg/Kg | ☼ | -122 | 80 - 120 | 19 | 20 |

## Method: EPA 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 180-265340/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 265515** — **Prep Batch: 265340**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND | | 0.200 | 0.0620 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Arsenic | ND | | 0.100 | 0.0260 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 180-265340/1-A**
**Matrix: Solid**
**Analysis Batch: 265515**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 265340**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Barium | ND | | 1.00 | 0.0570 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Beryllium | ND | | 0.100 | 0.00750 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Boron | 0.9690 | J | 8.00 | 0.763 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Cadmium | ND | | 0.100 | 0.0170 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Calcium | ND | | 50.0 | 8.95 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Chromium | ND | | 0.200 | 0.0660 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Cobalt | ND | | 0.0500 | 0.00830 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Copper | ND | | 0.200 | 0.113 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Lead | ND | | 0.100 | 0.0350 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Lithium | ND | | 0.500 | 0.276 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Molybdenum | ND | | 0.500 | 0.0620 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Nickel | ND | | 0.100 | 0.0610 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Selenium | ND | | 0.500 | 0.0600 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Silver | ND | | 0.100 | 0.0140 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Thallium | ND | | 0.100 | 0.0130 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Vanadium | 0.09950 | J | 0.100 | 0.0610 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |
| Zinc | ND | | 0.500 | 0.334 | mg/Kg | | 12/12/18 09:26 | 12/13/18 12:54 | 1 |

**Lab Sample ID: LCS 180-265340/2-A**
**Matrix: Solid**
**Analysis Batch: 265515**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 265340**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 50.0 | 52.67 | | mg/Kg | | 105 | 80 - 120 |
| Arsenic | 4.00 | 3.797 | | mg/Kg | | 95 | 80 - 120 |
| Barium | 200 | 209.8 | | mg/Kg | | 105 | 80 - 120 |
| Beryllium | 5.00 | 5.020 | | mg/Kg | | 100 | 80 - 120 |
| Boron | 100 | 96.79 | | mg/Kg | | 97 | 80 - 120 |
| Cadmium | 5.00 | 5.143 | | mg/Kg | | 103 | 80 - 120 |
| Calcium | 5000 | 4769 | | mg/Kg | | 95 | 80 - 120 |
| Chromium | 20.0 | 19.84 | | mg/Kg | | 99 | 80 - 120 |
| Cobalt | 50.0 | 47.76 | | mg/Kg | | 96 | 80 - 120 |
| Copper | 25.0 | 23.84 | | mg/Kg | | 95 | 80 - 120 |
| Lead | 2.00 | 1.832 | | mg/Kg | | 92 | 80 - 120 |
| Lithium | 5.00 | 4.629 | | mg/Kg | | 93 | 80 - 120 |
| Molybdenum | 100 | 106.8 | | mg/Kg | | 107 | 80 - 120 |
| Nickel | 50.0 | 46.97 | | mg/Kg | | 94 | 80 - 120 |
| Selenium | 1.00 | 0.9403 | | mg/Kg | | 94 | 80 - 120 |
| Silver | 5.00 | 4.642 | | mg/Kg | | 93 | 80 - 120 |
| Thallium | 5.00 | 4.696 | | mg/Kg | | 94 | 80 - 120 |
| Vanadium | 50.0 | 47.31 | | mg/Kg | | 95 | 80 - 120 |
| Zinc | 50.0 | 47.83 | | mg/Kg | | 96 | 80 - 120 |

**Lab Sample ID: 490-164486-A-8-B MS**
**Matrix: Solid**
**Analysis Batch: 265515**

**Client Sample ID: Matrix Spike**
**Prep Type: Total/NA**
**Prep Batch: 265340**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.299 | F1 | 65.3 | 46.96 | F1 | mg/Kg | ☼ | 71 | 75 - 125 |

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 490-164486-A-8-B MS**
**Matrix: Solid**
**Analysis Batch: 265515**

**Client Sample ID: Matrix Spike**
**Prep Type: Total/NA**
**Prep Batch: 265340**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6.53 | | 5.23 | 10.58 | | mg/Kg | ☼ | 78 | 75 - 125 |
| Barium | 75.3 | | 261 | 354.7 | | mg/Kg | ☼ | 107 | 75 - 125 |
| Beryllium | 0.347 | | 6.53 | 5.952 | | mg/Kg | ☼ | 86 | 75 - 125 |
| Boron | 2.17 | J B | 131 | 122.8 | | mg/Kg | ☼ | 92 | 75 - 125 |
| Cadmium | 0.0716 | J | 6.53 | 6.531 | | mg/Kg | ☼ | 99 | 75 - 125 |
| Calcium | 444 | | 6530 | 5974 | | mg/Kg | ☼ | 85 | 75 - 125 |
| Chromium | 17.0 | F1 | 26.1 | 44.81 | | mg/Kg | ☼ | 106 | 75 - 125 |
| Cobalt | 4.06 | | 65.3 | 59.62 | | mg/Kg | ☼ | 85 | 75 - 125 |
| Copper | 8.88 | | 32.7 | 39.90 | | mg/Kg | ☼ | 95 | 75 - 125 |
| Lead | 9.60 | F1 | 2.61 | 11.77 | | mg/Kg | ☼ | 83 | 75 - 125 |
| Lithium | 6.79 | F1 | 6.53 | 19.13 | F1 | mg/Kg | ☼ | 189 | 75 - 125 |
| Molybdenum | 1.82 | | 131 | 126.3 | | mg/Kg | ☼ | 95 | 75 - 125 |
| Nickel | 13.1 | | 65.3 | 74.64 | | mg/Kg | ☼ | 94 | 75 - 125 |
| Selenium | 0.688 | | 1.31 | 1.958 | | mg/Kg | ☼ | 97 | 75 - 125 |
| Silver | 0.0549 | J | 6.53 | 6.175 | | mg/Kg | ☼ | 94 | 75 - 125 |
| Thallium | 0.212 | | 6.53 | 5.935 | | mg/Kg | ☼ | 88 | 75 - 125 |
| Vanadium | 33.2 | B | 65.3 | 103.0 | | mg/Kg | ☼ | 107 | 75 - 125 |
| Zinc | 32.5 | | 65.3 | 100.9 | | mg/Kg | ☼ | 105 | 75 - 125 |

**Lab Sample ID: 490-164486-A-8-C MSD**
**Matrix: Solid**
**Analysis Batch: 265515**

**Client Sample ID: Matrix Spike Duplicate**
**Prep Type: Total/NA**
**Prep Batch: 265340**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.299 | F1 | 66.0 | 48.90 | F1 | mg/Kg | ☼ | 74 | 75 - 125 | 4 | 20 |
| Arsenic | 6.53 | | 5.28 | 10.75 | | mg/Kg | ☼ | 80 | 75 - 125 | 2 | 20 |
| Barium | 75.3 | | 264 | 346.3 | | mg/Kg | ☼ | 103 | 75 - 125 | 2 | 20 |
| Beryllium | 0.347 | | 6.60 | 5.890 | | mg/Kg | ☼ | 84 | 75 - 125 | 1 | 20 |
| Boron | 2.17 | J B | 132 | 123.9 | | mg/Kg | ☼ | 92 | 75 - 125 | 1 | 20 |
| Cadmium | 0.0716 | J | 6.60 | 6.566 | | mg/Kg | ☼ | 98 | 75 - 125 | 1 | 20 |
| Calcium | 444 | | 6600 | 6017 | | mg/Kg | ☼ | 84 | 75 - 125 | 1 | 20 |
| Chromium | 17.0 | F1 | 26.4 | 52.00 | F1 | mg/Kg | ☼ | 132 | 75 - 125 | 15 | 20 |
| Cobalt | 4.06 | | 66.0 | 60.29 | | mg/Kg | ☼ | 85 | 75 - 125 | 1 | 20 |
| Copper | 8.88 | | 33.0 | 38.49 | | mg/Kg | ☼ | 90 | 75 - 125 | 4 | 20 |
| Lead | 9.60 | F1 | 2.64 | 11.49 | F1 | mg/Kg | ☼ | 72 | 75 - 125 | 2 | 20 |
| Lithium | 6.79 | F1 | 6.60 | 17.76 | F1 | mg/Kg | ☼ | 166 | 75 - 125 | 7 | 20 |
| Molybdenum | 1.82 | | 132 | 127.0 | | mg/Kg | ☼ | 95 | 75 - 125 | 1 | 20 |
| Nickel | 13.1 | | 66.0 | 74.42 | | mg/Kg | ☼ | 93 | 75 - 125 | 0 | 20 |
| Selenium | 0.688 | | 1.32 | 1.794 | | mg/Kg | ☼ | 84 | 75 - 125 | 9 | 20 |
| Silver | 0.0549 | J | 6.60 | 6.235 | | mg/Kg | ☼ | 94 | 75 - 125 | 1 | 20 |
| Thallium | 0.212 | | 6.60 | 6.116 | | mg/Kg | ☼ | 89 | 75 - 125 | 3 | 20 |
| Vanadium | 33.2 | B | 66.0 | 99.90 | | mg/Kg | ☼ | 101 | 75 - 125 | 3 | 20 |
| Zinc | 32.5 | | 66.0 | 97.51 | | mg/Kg | ☼ | 99 | 75 - 125 | 3 | 20 |

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 180-265317/1-A**
**Matrix: Water**
**Analysis Batch: 265515**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 265317**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND | | 0.00200 | 0.00112 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Arsenic | ND | | 0.00100 | 0.000323 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Barium | ND | | 0.0100 | 0.000373 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Beryllium | ND | | 0.00100 | 0.0000570 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Cadmium | ND | | 0.00100 | 0.000125 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Calcium | ND | | 0.500 | 0.116 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Chromium | ND | | 0.00200 | 0.000631 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Cobalt | ND | | 0.000500 | 0.0000750 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Copper | ND | | 0.00200 | 0.00130 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Lead | ND | | 0.00100 | 0.0000940 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Lithium | ND | | 0.00500 | 0.00256 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Molybdenum | ND | | 0.00500 | 0.000474 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Nickel | ND | | 0.00100 | 0.000312 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Selenium | ND | | 0.00500 | 0.000813 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Silver | 0.0001430 | J | 0.00100 | 0.000121 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Thallium | ND | | 0.00100 | 0.0000630 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Vanadium | ND | | 0.00100 | 0.000899 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |
| Zinc | ND | | 0.00500 | 0.00242 | mg/L | | 12/12/18 06:51 | 12/13/18 08:10 | 1 |

**Lab Sample ID: MB 180-265317/1-A**
**Matrix: Water**
**Analysis Batch: 265706**

**Client Sample ID: Method Blank**
**Prep Type: Total Recoverable**
**Prep Batch: 265317**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Boron | ND | | 0.0800 | 0.0303 | mg/L | | 12/12/18 06:51 | 12/14/18 21:34 | 1 |

**Lab Sample ID: LCS 180-265317/2-A**
**Matrix: Water**
**Analysis Batch: 265515**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total Recoverable**
**Prep Batch: 265317**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 0.500 | 0.5106 | | mg/L | | 102 | 80 - 120 |
| Arsenic | 0.0400 | 0.03619 | | mg/L | | 90 | 80 - 120 |
| Barium | 2.00 | 1.999 | | mg/L | | 100 | 80 - 120 |
| Beryllium | 0.0500 | 0.05012 | | mg/L | | 100 | 80 - 120 |
| Cadmium | 0.0500 | 0.05302 | | mg/L | | 106 | 80 - 120 |
| Calcium | 50.0 | 48.94 | | mg/L | | 98 | 80 - 120 |
| Chromium | 0.200 | 0.2066 | | mg/L | | 103 | 80 - 120 |
| Cobalt | 0.500 | 0.4460 | | mg/L | | 89 | 80 - 120 |
| Copper | 0.250 | 0.2383 | | mg/L | | 95 | 80 - 120 |
| Lead | 0.0200 | 0.01996 | | mg/L | | 100 | 80 - 120 |
| Lithium | 0.0500 | 0.04521 | | mg/L | | 90 | 80 - 120 |
| Molybdenum | 1.00 | 1.019 | | mg/L | | 102 | 80 - 120 |
| Nickel | 0.500 | 0.4579 | | mg/L | | 92 | 80 - 120 |
| Selenium | 0.0100 | 0.009642 | | mg/L | | 96 | 80 - 120 |
| Silver | 0.0500 | 0.05110 | | mg/L | | 102 | 80 - 120 |
| Thallium | 0.0500 | 0.05425 | | mg/L | | 109 | 80 - 120 |
| Vanadium | 0.500 | 0.4768 | | mg/L | | 95 | 80 - 120 |

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 180-265317/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265515** — **Prep Batch: 265317**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Zinc | 0.500 | 0.4523 | | mg/L | | 90 | 80 - 120 |

**Lab Sample ID: LCS 180-265317/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265706** — **Prep Batch: 265317**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Boron | 1.00 | 1.075 | | mg/L | | 108 | 80 - 120 |

**Lab Sample ID: 180-84710-E-4-E MS** — **Client Sample ID: Matrix Spike**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265515** — **Prep Batch: 265317**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND | | 0.500 | 0.5177 | | mg/L | | 104 | 75 - 125 |
| Arsenic | 0.00352 | | 0.0400 | 0.03943 | | mg/L | | 90 | 75 - 125 |
| Barium | 0.0530 | | 2.00 | 2.062 | | mg/L | | 100 | 75 - 125 |
| Beryllium | ND | | 0.0500 | 0.04612 | | mg/L | | 92 | 75 - 125 |
| Cadmium | 0.000178 | J | 0.0500 | 0.05230 | | mg/L | | 104 | 75 - 125 |
| Calcium | 267 | | 50.0 | 304.1 | 4 | mg/L | | 75 | 75 - 125 |
| Chromium | 0.00176 | J | 0.200 | 0.2086 | | mg/L | | 103 | 75 - 125 |
| Cobalt | 0.00176 | | 0.500 | 0.4480 | | mg/L | | 89 | 75 - 125 |
| Copper | ND | | 0.250 | 0.2351 | | mg/L | | 94 | 75 - 125 |
| Lead | 0.000309 | J | 0.0200 | 0.02000 | | mg/L | | 98 | 75 - 125 |
| Lithium | 0.0120 | | 0.0500 | 0.05671 | | mg/L | | 89 | 75 - 125 |
| Molybdenum | 0.435 | | 1.00 | 1.468 | | mg/L | | 103 | 75 - 125 |
| Nickel | 0.00183 | | 0.500 | 0.4525 | | mg/L | | 90 | 75 - 125 |
| Selenium | ND | | 0.0100 | 0.009588 | | mg/L | | 96 | 75 - 125 |
| Silver | 0.000681 | J B | 0.0500 | 0.04965 | | mg/L | | 98 | 75 - 125 |
| Thallium | ND | | 0.0500 | 0.05573 | | mg/L | | 111 | 75 - 125 |
| Vanadium | 0.00139 | | 0.500 | 0.4775 | | mg/L | | 95 | 75 - 125 |
| Zinc | 0.00551 | | 0.500 | 0.4414 | | mg/L | | 87 | 75 - 125 |

**Lab Sample ID: 180-84710-E-4-E MS ^10** — **Client Sample ID: Matrix Spike**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265706** — **Prep Batch: 265317**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 13.5 | | 1.00 | 14.23 | 4 | mg/L | | 71 | 75 - 125 |

**Lab Sample ID: 180-84710-E-4-F MSD** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265515** — **Prep Batch: 265317**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | ND | | 0.500 | 0.5251 | | mg/L | | 105 | 75 - 125 | 1 | 20 |
| Arsenic | 0.00352 | | 0.0400 | 0.04013 | | mg/L | | 92 | 75 - 125 | 2 | 20 |
| Barium | 0.0530 | | 2.00 | 2.084 | | mg/L | | 102 | 75 - 125 | 1 | 20 |
| Beryllium | ND | | 0.0500 | 0.04614 | | mg/L | | 92 | 75 - 125 | 0 | 20 |

## Method: EPA 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 180-84710-E-4-F MSD** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265515** — **Prep Batch: 265317**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.000178 | J | 0.0500 | 0.05311 | | mg/L | | 106 | 75 - 125 | 2 | 20 |
| Calcium | 267 | | 50.0 | 303.4 | 4 | mg/L | | 74 | 75 - 125 | 0 | 20 |
| Chromium | 0.00176 | J | 0.200 | 0.2130 | | mg/L | | 106 | 75 - 125 | 2 | 20 |
| Cobalt | 0.00176 | | 0.500 | 0.4518 | | mg/L | | 90 | 75 - 125 | 1 | 20 |
| Copper | ND | | 0.250 | 0.2386 | | mg/L | | 95 | 75 - 125 | 1 | 20 |
| Lead | 0.000309 | J | 0.0200 | 0.02028 | | mg/L | | 100 | 75 - 125 | 1 | 20 |
| Lithium | 0.0120 | | 0.0500 | 0.05630 | | mg/L | | 89 | 75 - 125 | 1 | 20 |
| Molybdenum | 0.435 | | 1.00 | 1.497 | | mg/L | | 106 | 75 - 125 | 2 | 20 |
| Nickel | 0.00183 | | 0.500 | 0.4562 | | mg/L | | 91 | 75 - 125 | 1 | 20 |
| Selenium | ND | | 0.0100 | 0.009468 | | mg/L | | 95 | 75 - 125 | 1 | 20 |
| Silver | 0.000681 | J B | 0.0500 | 0.05059 | | mg/L | | 100 | 75 - 125 | 2 | 20 |
| Thallium | ND | | 0.0500 | 0.05693 | | mg/L | | 114 | 75 - 125 | 2 | 20 |
| Vanadium | 0.00139 | | 0.500 | 0.4761 | | mg/L | | 95 | 75 - 125 | 0 | 20 |
| Zinc | 0.00551 | | 0.500 | 0.4475 | | mg/L | | 88 | 75 - 125 | 1 | 20 |

**Lab Sample ID: 180-84710-E-4-F MSD ^10** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Water** — **Prep Type: Total Recoverable**
**Analysis Batch: 265706** — **Prep Batch: 265317**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 13.5 | | 1.00 | 14.36 | 4 | mg/L | | 84 | 75 - 125 | 1 | 20 |

## Method: EPA 7470A - Mercury (CVAA)

**Lab Sample ID: MB 180-265414/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 265537** — **Prep Batch: 265414**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 0.0000653 | mg/L | | 12/12/18 16:06 | 12/13/18 16:08 | 1 |

**Lab Sample ID: LCS 180-265414/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 265537** — **Prep Batch: 265414**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 0.00250 | 0.002341 | | mg/L | | 94 | 80 - 120 |

**Lab Sample ID: 490-164548-B-1-D MS** — **Client Sample ID: Matrix Spike**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 265537** — **Prep Batch: 265414**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0000880 | J F1 | 0.00100 | 0.0008130 | F1 | mg/L | | 73 | 75 - 125 |

## Method: EPA 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: 490-164548-B-1-E MSD** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 265537** — **Prep Batch: 265414**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0000880 | J F1 | 0.00100 | 0.0007810 | F1 | mg/L | | 69 | 75 - 125 | 4 | 20 |

## Method: EPA 7471B - Mercury (CVAA)

**Lab Sample ID: MB 180-265423/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 265509** — **Prep Batch: 265423**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.0330 | 0.0143 | mg/Kg | | 12/12/18 18:27 | 12/13/18 13:17 | 1 |

**Lab Sample ID: LCS 180-265423/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 265509** — **Prep Batch: 265423**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 0.417 | 0.4090 | | mg/Kg | | 98 | 80 - 120 |

**Lab Sample ID: 490-164486-A-8-E MS** — **Client Sample ID: Matrix Spike**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 265509** — **Prep Batch: 265423**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0487 | | 0.212 | 0.2445 | | mg/Kg | ☼ | 92 | 80 - 120 |

**Lab Sample ID: 490-164486-A-8-F MSD** — **Client Sample ID: Matrix Spike Duplicate**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 265509** — **Prep Batch: 265423**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0487 | | 0.212 | 0.2570 | | mg/Kg | ☼ | 98 | 80 - 120 | 5 | 20 |

## Method: 9045D - pH

**Lab Sample ID: LCS 490-563002/1** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 563002**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH | 7.00 | 7.0 | | SU | | 101 | 98 - 103 |

**Lab Sample ID: 490-164486-B-9-B DU** — **Client Sample ID: Duplicate**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 563002**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| pH | 6.7 | | 6.7 | | SU | | 0 | 20 |

# QC Sample Results

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Method: Moisture - Percent Moisture

**Lab Sample ID: 490-164472-H-14 DU**
**Matrix: Solid**
**Analysis Batch: 562643**

**Client Sample ID: Duplicate**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 3.2 | | | 4.5 | F3 | % | | | | 34 | 20 |
| Percent Solids | 96.8 | | | 95.5 | | % | | | | 1 | 20 |

# QC Association Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## HPLC/IC

### Leach Batch: 562165

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Soluble | Solid | DI Leach | |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Soluble | Solid | DI Leach | |
| MB 490-562165/1-A | Method Blank | Soluble | Solid | DI Leach | |
| LCS 490-562165/2-A | Lab Control Sample | Soluble | Solid | DI Leach | |
| LCSD 490-562165/3-A | Lab Control Sample Dup | Soluble | Solid | DI Leach | |
| 490-164471-A-2-C MS | Matrix Spike | Soluble | Solid | DI Leach | |
| 490-164471-A-2-D MSD | Matrix Spike Duplicate | Soluble | Solid | DI Leach | |

### Analysis Batch: 562242

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total/NA | Water | 9056A | |
| MB 490-562242/3 | Method Blank | Total/NA | Water | 9056A | |
| LCS 490-562242/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 490-562242/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| 490-164468-B-1 MS | Matrix Spike | Total/NA | Water | 9056A | |
| 490-164468-B-1 MSD | Matrix Spike Duplicate | Total/NA | Water | 9056A | |

### Analysis Batch: 562319

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Soluble | Solid | 9056A | 562165 |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Soluble | Solid | 9056A | 562165 |
| MB 490-562165/1-A | Method Blank | Soluble | Solid | 9056A | 562165 |
| LCS 490-562165/2-A | Lab Control Sample | Soluble | Solid | 9056A | 562165 |
| LCSD 490-562165/3-A | Lab Control Sample Dup | Soluble | Solid | 9056A | 562165 |
| MRL 490-562319/2 | Lab Control Sample | Total/NA | Solid | 9056A | |
| MRL 490-562319/32 | Lab Control Sample | Total/NA | Solid | 9056A | |
| 490-164471-A-2-C MS | Matrix Spike | Soluble | Solid | 9056A | 562165 |
| 490-164471-A-2-D MSD | Matrix Spike Duplicate | Soluble | Solid | 9056A | 562165 |

## Metals

### Prep Batch: 265317

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total Recoverable | Water | 3005A | |
| MB 180-265317/1-A | Method Blank | Total Recoverable | Water | 3005A | |
| LCS 180-265317/2-A | Lab Control Sample | Total Recoverable | Water | 3005A | |
| 180-84710-E-4-E MS | Matrix Spike | Total Recoverable | Water | 3005A | |
| 180-84710-E-4-E MS ^10 | Matrix Spike | Total Recoverable | Water | 3005A | |
| 180-84710-E-4-F MSD | Matrix Spike Duplicate | Total Recoverable | Water | 3005A | |
| 180-84710-E-4-F MSD ^10 | Matrix Spike Duplicate | Total Recoverable | Water | 3005A | |

### Prep Batch: 265340

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Total/NA | Solid | 3050B | |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Total/NA | Solid | 3050B | |
| MB 180-265340/1-A | Method Blank | Total/NA | Solid | 3050B | |
| LCS 180-265340/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| 490-164486-A-8-B MS | Matrix Spike | Total/NA | Solid | 3050B | |
| 490-164486-A-8-C MSD | Matrix Spike Duplicate | Total/NA | Solid | 3050B | |

## Metals (Continued)

### Prep Batch: 265414

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total/NA | Water | 7470A | |
| MB 180-265414/1-A | Method Blank | Total/NA | Water | 7470A | |
| LCS 180-265414/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| 490-164548-B-1-D MS | Matrix Spike | Total/NA | Water | 7470A | |
| 490-164548-B-1-E MSD | Matrix Spike Duplicate | Total/NA | Water | 7470A | |

### Prep Batch: 265423

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Total/NA | Solid | 7471B | |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Total/NA | Solid | 7471B | |
| MB 180-265423/1-A | Method Blank | Total/NA | Solid | 7471B | |
| LCS 180-265423/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| 490-164486-A-8-E MS | Matrix Spike | Total/NA | Solid | 7471B | |
| 490-164486-A-8-F MSD | Matrix Spike Duplicate | Total/NA | Solid | 7471B | |

### Analysis Batch: 265509

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Total/NA | Solid | EPA 7471B | 265423 |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Total/NA | Solid | EPA 7471B | 265423 |
| MB 180-265423/1-A | Method Blank | Total/NA | Solid | EPA 7471B | 265423 |
| LCS 180-265423/2-A | Lab Control Sample | Total/NA | Solid | EPA 7471B | 265423 |
| 490-164486-A-8-E MS | Matrix Spike | Total/NA | Solid | EPA 7471B | 265423 |
| 490-164486-A-8-F MSD | Matrix Spike Duplicate | Total/NA | Solid | EPA 7471B | 265423 |

### Analysis Batch: 265515

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Total/NA | Solid | EPA 6020A | 265340 |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Total/NA | Solid | EPA 6020A | 265340 |
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total Recoverable | Water | EPA 6020A | 265317 |
| MB 180-265317/1-A | Method Blank | Total Recoverable | Water | EPA 6020A | 265317 |
| MB 180-265340/1-A | Method Blank | Total/NA | Solid | EPA 6020A | 265340 |
| LCS 180-265317/2-A | Lab Control Sample | Total Recoverable | Water | EPA 6020A | 265317 |
| LCS 180-265340/2-A | Lab Control Sample | Total/NA | Solid | EPA 6020A | 265340 |
| 180-84710-E-4-E MS | Matrix Spike | Total Recoverable | Water | EPA 6020A | 265317 |
| 180-84710-E-4-F MSD | Matrix Spike Duplicate | Total Recoverable | Water | EPA 6020A | 265317 |
| 490-164486-A-8-B MS | Matrix Spike | Total/NA | Solid | EPA 6020A | 265340 |
| 490-164486-A-8-C MSD | Matrix Spike Duplicate | Total/NA | Solid | EPA 6020A | 265340 |

### Analysis Batch: 265537

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total/NA | Water | EPA 7470A | 265414 |
| MB 180-265414/1-A | Method Blank | Total/NA | Water | EPA 7470A | 265414 |
| LCS 180-265414/2-A | Lab Control Sample | Total/NA | Water | EPA 7470A | 265414 |
| 490-164548-B-1-D MS | Matrix Spike | Total/NA | Water | EPA 7470A | 265414 |
| 490-164548-B-1-E MSD | Matrix Spike Duplicate | Total/NA | Water | EPA 7470A | 265414 |

### Analysis Batch: 265706

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-3 | CUF-BS-FB-14-20181206 | Total Recoverable | Water | EPA 6020A | 265317 |
| MB 180-265317/1-A | Method Blank | Total Recoverable | Water | EPA 6020A | 265317 |
| LCS 180-265317/2-A | Lab Control Sample | Total Recoverable | Water | EPA 6020A | 265317 |

## Metals (Continued)

### Analysis Batch: 265706 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 180-84710-E-4-E MS ^10 | Matrix Spike | Total Recoverable | Water | EPA 6020A | 265317 |
| 180-84710-E-4-F MSD ^10 | Matrix Spike Duplicate | Total Recoverable | Water | EPA 6020A | 265317 |

## General Chemistry

### Analysis Batch: 562643

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Total/NA | Solid | Moisture | |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Total/NA | Solid | Moisture | |
| 490-164472-H-14 DU | Duplicate | Total/NA | Solid | Moisture | |

### Leach Batch: 562999

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Soluble | Solid | DI Leach | |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Soluble | Solid | DI Leach | |
| 490-164486-B-9-B DU | Duplicate | Soluble | Solid | DI Leach | |

### Analysis Batch: 563002

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 490-164488-1 | CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206 | Soluble | Solid | 9045D | 562999 |
| 490-164488-2 | CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206 | Soluble | Solid | 9045D | 562999 |
| LCS 490-563002/1 | Lab Control Sample | Total/NA | Solid | 9045D | |
| 490-164486-B-9-B DU | Duplicate | Soluble | Solid | 9045D | 562999 |

# Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Client Sample ID: CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206

**Lab Sample ID: 490-164488-1**

**Date Collected: 12/06/18 10:01**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 20 g | 20 mL | 562999 | 12/11/18 18:28 | MXX | TAL NSH |
| Soluble | Analysis | 9045D | | 1 | 20 g | 20 mL | 563002 | 12/11/18 18:34 | MXX | TAL NSH |
| Total/NA | Analysis | Moisture | | 1 | | | 562643 | 12/10/18 14:06 | BAA | TAL NSH |

## Client Sample ID: CUF-BS-CUF-1004ALT2A-12.0/13.5-20181206

**Lab Sample ID: 490-164488-1**

**Date Collected: 12/06/18 10:01**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**
**Percent Solids: 72.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 2.9886 g | 30 mL | 562165 | 12/07/18 11:41 | SOO | TAL NSH |
| Soluble | Analysis | 9056A | | 1 | | | 562319 | 12/08/18 03:21 | T1C | TAL NSH |
| Total/NA | Prep | 3050B | | | 1.01 g | 100 mL | 265340 | 12/12/18 09:26 | RJR | TAL PIT |
| Total/NA | Analysis | EPA 6020A | | 1 | | | 265515 | 12/13/18 13:44 | RSK | TAL PIT |
| Total/NA | Prep | 7471B | | | 0.63 g | 100 mL | 265423 | 12/12/18 18:27 | KA | TAL PIT |
| Total/NA | Analysis | EPA 7471B | | 1 | | | 265509 | 12/13/18 13:33 | KA | TAL PIT |

## Client Sample ID: CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206

**Lab Sample ID: 490-164488-2**

**Date Collected: 12/06/18 10:26**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 20 g | 20 mL | 562999 | 12/11/18 18:28 | MXX | TAL NSH |
| Soluble | Analysis | 9045D | | 1 | 20 g | 20 mL | 563002 | 12/11/18 18:34 | MXX | TAL NSH |
| Total/NA | Analysis | Moisture | | 1 | | | 562643 | 12/10/18 14:06 | BAA | TAL NSH |

## Client Sample ID: CUF-BS-CUF-1004ALT2A-16.5/18.0-20181206

**Lab Sample ID: 490-164488-2**

**Date Collected: 12/06/18 10:26**
**Date Received: 12/06/18 18:10**

**Matrix: Solid**
**Percent Solids: 72.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 3.0304 g | 30 mL | 562165 | 12/07/18 11:41 | SOO | TAL NSH |
| Soluble | Analysis | 9056A | | 1 | | | 562319 | 12/08/18 03:38 | T1C | TAL NSH |
| Total/NA | Prep | 3050B | | | 0.99 g | 100 mL | 265340 | 12/12/18 09:26 | RJR | TAL PIT |
| Total/NA | Analysis | EPA 6020A | | 1 | | | 265515 | 12/13/18 13:47 | RSK | TAL PIT |
| Total/NA | Prep | 7471B | | | 0.63 g | 100 mL | 265423 | 12/12/18 18:27 | KA | TAL PIT |
| Total/NA | Analysis | EPA 7471B | | 1 | | | 265509 | 12/13/18 13:34 | KA | TAL PIT |

# Lab Chronicle

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Client Sample ID: CUF-BS-FB-14-20181206

**Lab Sample ID: 490-164488-3**

**Date Collected: 12/06/18 13:00**

**Matrix: Water**

**Date Received: 12/06/18 18:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | | | 562242 | 12/07/18 17:08 | T1C | TAL NSH |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 265317 | 12/12/18 06:51 | RJR | TAL PIT |
| Total Recoverable | Analysis | EPA 6020A | | 1 | | | 265515 | 12/13/18 09:19 | RSK | TAL PIT |
| Total Recoverable | Prep | 3005A | | | 50 mL | 50 mL | 265317 | 12/12/18 06:51 | RJR | TAL PIT |
| Total Recoverable | Analysis | EPA 6020A | | 1 | 1.0 mL | 1.0 mL | 265706 | 12/14/18 23:11 | RJR | TAL PIT |
| Total/NA | Prep | 7470A | | | 50 mL | 50 mL | 265414 | 12/12/18 16:06 | KA | TAL PIT |
| Total/NA | Analysis | EPA 7470A | | 1 | | | 265537 | 12/13/18 16:12 | KA | TAL PIT |

**Laboratory References:**

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# Method Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 9056A | Anions, Ion Chromatography | SW846 | TAL NSH |
| EPA 6020A | Metals (ICP/MS) | SW846 | TAL PIT |
| EPA 7470A | Mercury (CVAA) | SW846 | TAL PIT |
| EPA 7471B | Mercury (CVAA) | SW846 | TAL PIT |
| 9045D | pH | SW846 | TAL NSH |
| Moisture | Percent Moisture | EPA | TAL NSH |
| 3005A | Preparation, Total Recoverable or Dissolved Metals | SW846 | TAL PIT |
| 3050B | Preparation, Metals | SW846 | TAL PIT |
| 7470A | Preparation, Mercury | SW846 | TAL PIT |
| 7471B | Preparation, Mercury | SW846 | TAL PIT |
| DI Leach | Deionized Water Leaching Procedure | ASTM | TAL NSH |

**Protocol References:**

ASTM = ASTM International
EPA = US Environmental Protection Agency
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177
TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# Accreditation/Certification Summary

Client: Environmental Standards Inc.
Project/Site: CUF_BS_20181206_2A

TestAmerica Job ID: 490-164488-1

## Laboratory: TestAmerica Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | ISO/IEC 17025 | | 0453.07 | 12-31-19 |
| Alaska (UST) | State Program | 10 | UST-087 | 06-30-19 |
| Arizona | State Program | 9 | AZ0473 | 05-05-19 |
| Arkansas DEQ | State Program | 6 | 88-0737 | 04-25-19 |
| California | State Program | 9 | 2938 | 10-31-18 * |
| Connecticut | State Program | 1 | PH-0220 | 12-31-19 |
| Florida | NELAP | 4 | E87358 | 06-30-19 |
| Georgia | State Program | 4 | NA: NELAP & A2LA | 12-31-19 |
| Illinois | NELAP | 5 | 200010 | 12-09-18 * |
| Iowa | State Program | 7 | 131 | 04-01-20 |
| Kansas | NELAP | 7 | E-10229 | 10-31-19 |
| Kentucky (UST) | State Program | 4 | 19 | 06-30-19 |
| Kentucky (WW) | State Program | 4 | 90038 | 12-31-18 |
| Louisiana | NELAP | 6 | 30613 | 06-30-19 |
| Maine | State Program | 1 | TN00032 | 11-03-19 |
| Maryland | State Program | 3 | 316 | 03-31-19 |
| Massachusetts | State Program | 1 | M-TN032 | 06-30-19 |
| Minnesota | NELAP | 5 | 047-999-345 | 12-31-18 |
| Mississippi | State Program | 4 | N/A | 06-30-19 |
| Montana (UST) | State Program | 8 | NA | 02-24-20 |
| Nevada | State Program | 9 | TN00032 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2963 | 10-09-19 |
| New Jersey | NELAP | 2 | TN965 | 06-30-19 |
| New York | NELAP | 2 | 11342 | 03-31-19 |
| North Carolina (WW/SW) | State Program | 4 | 387 | 12-31-18 |
| North Dakota | State Program | 8 | R-146 | 06-30-19 |
| Ohio VAP | State Program | 5 | CL0033 | 07-06-19 |
| Oklahoma | State Program | 6 | 9412 | 08-31-19 |
| Oregon | NELAP | 10 | TN200001 | 04-26-19 |
| Pennsylvania | NELAP | 3 | 68-00585 | 07-31-19 |
| Rhode Island | State Program | 1 | LAO00268 | 12-30-18 |
| South Carolina | State Program | 4 | 84009 (001) | 02-28-19 |
| Tennessee | State Program | 4 | 2008 | 02-23-20 |
| Texas | NELAP | 6 | T104704077 | 08-31-19 |
| USDA | Federal | | P330-13-00306 | 12-01-19 |
| Utah | NELAP | 8 | TN00032 | 07-31-19 |
| Virginia | NELAP | 3 | 460152 | 06-14-19 |
| Washington | State Program | 10 | C789 | 07-19-19 |
| West Virginia DEP | State Program | 3 | 219 | 02-28-19 |
| Wisconsin | State Program | 5 | 998020430 | 08-31-19 |
| Wyoming (UST) | A2LA | 8 | 453.07 | 12-31-19 |

## Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Arkansas DEQ | State Program | 6 | 88-0690 | 06-27-19 |
| California | State Program | 9 | 2891 | 04-30-19 |
| Connecticut | State Program | 1 | PH-0688 | 09-30-20 |
| Florida | NELAP | 4 | E871008 | 06-30-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

## Laboratory: TestAmerica Pittsburgh (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Illinois | NELAP | 5 | 200005 | 06-30-19 |
| Kansas | NELAP | 7 | E-10350 | 01-31-19 |
| Louisiana | NELAP | 6 | 04041 | 06-30-19 |
| Nevada | State Program | 9 | PA00164 | 07-31-19 |
| New Hampshire | NELAP | 1 | 2030 | 04-04-19 |
| New Jersey | NELAP | 2 | PA005 | 06-30-19 |
| New York | NELAP | 2 | 11182 | 03-31-19 |
| North Carolina (WW/SW) | State Program | 4 | 434 | 12-31-18 |
| Oregon | NELAP | 10 | PA-2151 | 01-28-19 |
| Pennsylvania | NELAP | 3 | 02-00416 | 04-30-19 |
| South Carolina | State Program | 4 | 89014 | 04-30-19 |
| Texas | NELAP | 6 | T104704528-15-2 | 03-31-19 |
| US Fish & Wildlife | Federal | | LE94312A-1 | 07-31-19 |
| USDA | Federal | | P330-16-00211 | 06-26-19 |
| Utah | NELAP | 8 | PA001462015-4 | 05-31-19 |
| Virginia | NELAP | 3 | 460189 | 09-14-19 |
| West Virginia DEP | State Program | 3 | 142 | 01-31-19 |
| Wisconsin | State Program | 5 | 998027800 | 08-31-19 |

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

490-164488 Chain of Custody

# COOLER RECEIPT FORM

Cooler Received/Opened On 12/6/2018 @ 18:10

Time Samples Removed From Cooler_____ Time Samples Placed In Storage_____ (2 Hour Window)

1. Tracking #____NA_____(last 4 digits, FedEx) Courier: Lab

   IR Gun ID 31470366 pH Strip Lot_____ Chlorine Strip Lot_____

2. Temperature of rep. sample or temp blank when opened: 2.0 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where: 1 Front 1 Back

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) ACB

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # 1 of 4

I certify that I unloaded the cooler and answered questions 7-14 (intial) EA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) EA

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) EA

I certify that I attached a label with the unique LIMS number to each container (intial) EA

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

# TVA Environmental Investigations

Tennessee Valley Authority

| COOLER No.: | 1 | of | 1 |
|---|---|---|---|
| COC No: | CUF_BS_20181206_2A | | |
| 1 of 1 Pages | | | |
| Task Desc: | CUF_BS | | |

## Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | TestAmerica Nashville | Site ID #: | CUMBERLAND FOSSIL PLANT | Sampler: | Greg Budd, Dennis Mihalek |
| Lab Address: | 2960 Foster Creighton Drive | Project #: | 49014071 | Sampling Company: | Stantec |
| | Nashville, TN 37204 | Site Address | 815 Cumberland City Road | Address | 3502 Beaumont Circle |
| | | City | Cumberland City State, Zip: TN, 37763 | City/State | Lekington, KY Phone: 859-422-3000 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Gail Lage | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 2 |
| Phone/Fax: | 615-301-5741/615-726-3404 | Site PM Email: | jrquinn@tva.gov | Send EDD/Hard Copy to: | tva_deliverables@envstd.com |
| Lab Email: | Gail.Lage@testamericainc.com | | | | |

Analysis Turnaround Time

☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

☐ 24 Hours
☐ 3 Business Days
☑ 5 Business Days
☐ 10 Business Days (Standard)

Loc: 490
164488

| ITEMS # | SAMPLE ID Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth Start Depth | Sample Depth End Depth | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Filtered N | Filtered N | Filtered N | Preserve see comments | Preserve see comments | Preserve None | Analysis BACKGROUNDSOIL | Analysis BACKGROUNDSOIL_BLANKS | Analysis BACKGROUNDSOIL_PH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-BS-CUF-1004 ALT 2A- 12.0/13.5-20811206 | CUF-1004 | 12.0 | 13.5 | S | G | N | 12/6/2018 | 1001 | 2 | GS | ☐ | | | | | | | X | X | |
| 2 | CUF-BS-CUF-1004 ALT 2A- 16.5/18.0-20811206 | CUF-1004 | 16.5 | 18.0 | S | G | N | 12/6/2018 | 1026 | 2 | 12/6/18 | ☐ | | | | | | | X | X | |
| 3 | CUF-BS- FB-14-20181206 | CUF-1004 | NA | NA | W | G | FB | 12/6/2018 | 1300 | 2 | | ☐ | | | | | | | | X | |

Additional Comments/Special Instructions:

Additional volume collected should be used for MS/MSDs.

BACKGROUNDSOIL: Perform MS/MSD on sample identified above

BACKGROUNDSOIL_BLANKS: Anions – unpreserved; Metals – preserved w/ HNO3 to pH<2

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Greg Budd / Stantec | 12/06/18 | 1600 | | 12/6/18 | 1800 |
| GS 12/6/18 | | | GS 12/6/18 | | |
| | | | | | |

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Courier | Greg Budd |
| 12/06/18 | Dennis Mihalek |
| | 12/06/18 |

Sample Receipt Conditions

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| ☑ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☑ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |

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Page 27 of 31

12/17/2018



Form TVA 30067A

# TVA Environmental Investigations

Tennessee Valley Authority

## Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

| | |
|---|---|
| COOLER No.: | 1 of 1 |
| COC No: | CUF_BS_20181206_2A |
| 1 of 1 Pages | |
| Task Desc: | CUF_BS |

Rev.1 DC 12/10/18
Rev.2 DC 12/11/18

| Required Ship to Lab: | | Required Project Information: | | Required Sampler Information | |
|---|---|---|---|---|---|
| Lab Name: | TestAmerica Nashville | Site ID #: | CUMBERLAND FOSSIL PLANT | Sampler: | Greg Budd, Dennis Mihalek |
| Lab Address: | 2960 Foster Creighton Drive | Project #: | 49014071 | Sampling Company: | Stantec |
| | Nashville, TN 37204 | Site Address | 815 Cumberland City Road | Address | 3502 Beaumont Circle |
| | | City | Cumberland City State, Zip: TN, 37763 | City/State | Lexington, KY Phone: 859-422-3000 |
| Lab Manager Contact Information | | Site PM Name: | Roy Quinn | | |
| Lab PM: | Gail Lage | Phone/Fax: | 423-751-3753 | Sampling Team Number: | 2 |
| Phone/Fax: | 615-301-5741/615-726-3404 | Site PM Email: | rquinn@tva.gov | Send EDD/Hard Copy to: | tva_deliverables@envsta.com |
| Lab Email: | Gail.Lage@testamericainc.com | | | | |

Analysis Turnaround Time: ☐ CALENDAR DAYS ☑ WORKING DAYS

TAT if different from Below _____

- ☐ 24 Hours
- ☐ 3 Business Days
- ☑ 5 Business Days
- ☐ 10 Business Days (Standard)

Loc: 490
164488

| ITEMS # | SAMPLE ID (1004ALT2A DC 12/11/18; 20181206 DC 12/10/18) Samples IDs MUST BE UNIQUE | SAMPLE LOCATION | Sample Depth: Depth Unit | Sample Depth: Select Unit | MATRIX CODE | G= GRAB C=COMP | SAMPLE TYPE | SAMPLE DATE | SAMPLE TIME | # OF CONTAINERS | Comments/ Lab Sample I.D. | MS/MSD | Analysis: BACKGROUNDSOIL | Analysis: BACKGROUNDSOIL_BLANKS | Analysis: BACKGROUNDSOIL_PH | Filtered | Preserve: see comments | Preserve: see comments | Preserve: None |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CUF-BS-CUF-~~1004 ALT 2A~~- 12.0/13.5-~~20181206~~ | CUF-1004 | 12.0 | 13.5 | S | G | N | 12/6/2018 | 1001 | 2 | GS | ☐ | X | X | | N | N | N | |
| 2 | CUF-BS-CUF-~~1004 ALT 2A~~- 16.5/18.0-~~20181206~~ | CUF-1004 | 16.5 | 18.0 | S | G | N | 12/6/2018 | 1026 | 2 | 12/6/18 | ☐ | X | X | | | | | |
| 3 | CUF-BS- FB-14-20181206 | CUF-1004 | NA | NA | W | G | FB | 12/6/2018 | 1300 | 2 | | ☐ | | X | | | | | |

Additional Comments/Special Instructions:

Additional volume collected should be used for MS/MSDs.

BACKGROUNDSOIL: Perform MS/MSD on sample identified above

BACKGROUNDSOIL_BLANKS: Anions – unpreserved; Metals – preserved w/ HNO3 to pH<2

| RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME |
|---|---|---|---|---|---|
| Greg Budd / Stantec | 12/06/18 | 1600 | [signature] | 12/6/18 | 1800 |
| GS 12/6/18 | | | GS 12/6/18 | | |

| SHIPPING METHOD: | SAMPLER NAME AND SIGNATURE |
|---|---|
| Courier | Greg Budd [signature] |
| 12/06/18 | Dennis Mihalek [signature] |
| | 12/06/18 |

Sample Receipt Conditions

| Temperature in °C | Sample on Ice? | Sample Intact? | Trip Blank? |
|---|---|---|---|
| Yes / No | Yes / No | Yes / No | Yes / No |
| Yes / No | Yes / No | Yes / No | Yes / No |
| Yes / No | Yes / No | Yes / No | Yes / No |
| Yes / No | Yes / No | Yes / No | Yes / No |

2.0



Form TVA 30067A

**TestAmerica Nashville**
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

3DK Pat 1/28

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Lage, Gail | Carrier Tracking No(s): | COC No: 490-83531.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: gail.lage@testamericainc.com | State of Origin: Tennessee | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): | | Job #: 490-164488-1 |
| Address: 301 Alpha Drive, RIDC Park, | Due Date Requested: 12/12/2018 | | | |
| City: Pittsburgh | TAT Requested (days): | | | |
| State, Zip: PA, 15238 | | | | |
| Phone: 412-963-7058(Tel) 412-963-2468(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: CUF_BS_20181206_2A | Project #: 49014071 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | 6020A/3050B (MOD) Custom Metals | 7471B/7471B_Prep | 6020A/3005A (MOD) Custom Metals | 7470A/7470A_Prep | Total Number of containers | Special Instructions/Note |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | |
| CUF-BS-CUF-1004 ALT 2A-12.0/13.5-20181206 (490-164488-1) | 12/6/18 | 10:01 Central | | Solid | | | X | X | | | 1 | TVA |
| CUF-BS-CUF-1004 ALT 2A-16.5/18.0-20181206 (490-164488-2) | 12/6/18 | 10:26 Central | | Solid | | | X | X | | | 1 | TVA |
| CUF-BS-FB-14-20181206 (490-164488-3) | 12/6/18 | 13:00 Central | | Water | | | | | X | X | 1 | TVA |

490-164488 Chain of Custody

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-c... currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status shou... Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| | | | | | |
|---|---|---|---|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | | | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* | | |
| Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 2 | | Special Instructions/QC Requirements: | | |
| Empty Kit Relinquished by: | Date: | | Time: | Method of Shipment: | |
| Relinquished by: [signature] | Date/Time: 12-10-18 @ 1110 | Company: TANAS | Received by: D Watson | Date/Time: 12-11-18 | Company: TAPIT |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: 10:00 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: | | |

Ver: 09/20/2016

# Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-164488-1

**Login Number: 164488**
**List Number: 2**
**Creator: Watson, Debbie**

**List Source: TestAmerica Pittsburgh**
**List Creation: 12/11/18 04:00 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# Login Sample Receipt Checklist

Client: Environmental Standards Inc.

Job Number: 490-164488-1

**Login Number: 164488**
**List Number: 3**
**Creator: Watson, Debbie**

**List Source: TestAmerica Pittsburgh**
**List Creation: 12/11/18 04:01 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | False | |