



Tuesday, January 02, 2018

Karen Waters-Husted  
CH2M HILL Plateau Remediation Company  
825 Jadwin Avenue  
Richland, WA 99352

Re: ALS Workorder: 1712301  
Project Name: RCRA, DECEMBER 2017  
Project Number: W18-012

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 12/13/2017. The samples were scheduled for the following analysis:

Metals

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Julie Ellingson  
Project Manager

We certify that this data package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

<b>SAMPLE ISSUE RESOLUTION (SIR) REPORT</b>	<b>SIR Number:</b> SIR18-0521 <b>Rev. Number:</b> 0 <b>Date Initiated:</b> 03/06/2018
---	---

<b><u>SAMPLE EVENT INFORMATION</u></b>	
<b>SAF NUM(S):</b>	W18-012
<b>LABORATORY:</b>	ALS

<b><u>SAMPLING INFORMATION</u></b>	
<b>NUMBER OF SAMPLES:</b>	2
<b>SAMPLE NUMBERS:</b>	B3FKB1, B3FKB6
<b>SAMPLE MATRIX:</b>	WATER
<b>SDG NUM(S):</b>	ALS1712301

<b><u>ISSUE BACKGROUND</u></b>	
<b>CLASS:</b>	Chain of Custody Issue (Field)
<b>TYPE:</b>	No/Illegible Relinquisher/Receiver Listed on COC
<b>DESCRIPTION:</b>	COC-W18-012-001, there is a missing name in the first relinquished by box.

<b><u>RESOLUTION</u></b>	
<b>PROPOSED RESOLUTION:</b>	DOCUMENT AND CLOSE

<b>FINAL RESOLUTION:</b>	DOCUMENT AND CLOSE
--------------------------	--------------------

<b>SUBMITTED BY:</b>	
KESSINGER, AL _____	02/12/2018 _____
<b>ACCEPTED BY:</b>	
NAGEL, SE _____	03/06/2018 _____

ALS1712301

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

**OrderNum:** 1712301

**Client Name:** CH2M HILL Plateau Remediation Company

**Client Project Name:** RCRA, DECEMBER 2017

**Client Project Number:** W18-012

**Client PO Number:** BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3FKB1	1712301-1		WATER	11-Dec-17	13:03
B3FKB6	1712301-2		WATER	11-Dec-17	13:03

<b>CH2M Hill Plateau Remediation Company</b>	<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>	1712301 C.O.C.# <b>W18-012-001</b>
		Page 1 of 1

Collector: <b>Juan Aguilar</b> <small>ICHPRC</small>	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650
SAF No.: W18-012	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071
Project Title: RCRA, DECEMBER 2017	Logbook No.: HNF-N-506-97/32	Ice Chest No.: <b>GWS-706</b>
Shipped To (Lab): ALS Environmental Ft. Collins	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.: <b>770961954624</b>
Protocol RCRA	Priority: 15 Days PRIORITY	Offsite Property No.: <b>8846</b>

<b>POSSIBLE SAMPLE HAZARDS/REMARK</b> ** ** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1	<b>SPECIAL INSTRUCTIONS</b> N/A
---	------------------------------------

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3FKB1	N	W	12-11-17	1303	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	28 Days	HNO3 to pH <2
B3FKB6	Y	W	12-11-17	1303	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	28 Days	HNO3 to pH <2

Page 4 of 29

AFS1712301

March 6, 2018

Relinquished By: <b>[Signature]</b> <small>*Print First and Last Name</small> <b>DEC 11 2017</b> <b>1400</b> <small>Signature</small> <small>Date/Time</small>	Received By: <b>SSU-1</b> <small>Print First and Last Name</small> <b>DEC 11 2017</b> <b>1400</b> <small>Signature</small> <small>Date/Time</small>	<b>Matrix *</b> S = Soil      DS = Drum Solids SE = Sediment      DL = Drum Liquid SO = Solid      T = Tissue SL = Sludge      WI = Wipe W = Water      L = Liquid O = Oil      V = Vegetation A = Air      X = Other
Relinquished By: <b>SSU-1</b> <small>Print First and Last Name</small> <b>DEC 12 2017</b> <b>0700</b> <small>Signature</small> <small>Date/Time</small>	Received By: <b>Jeff Lucas</b> <small>Print First and Last Name</small> <b>DEC 12 2017</b> <b>0700</b> <small>Signature</small> <small>Date/Time</small>	
Relinquished By: <b>Jeff Lucas</b> <small>Print First and Last Name</small> <b>DEC 12 2017</b> <b>1400</b> <small>Signature</small> <small>Date/Time</small>	Received By: <b>FEDEX</b> <small>Print First and Last Name</small> <small>Signature</small> <small>Date/Time</small>	
Relinquished By: <b>FED EX</b> <small>Print First and Last Name</small> <small>Signature</small> <small>Date/Time</small>	Received By: <b>C. Trumble</b> <small>Print First and Last Name</small> <b>12-13-17</b> <b>0935</b> <small>Signature</small> <small>Date/Time</small>	
<b>FINAL SAMPLE DISPOSITION</b> Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:      Date/Time:

Revision 1

ALS1712301



ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1712301

Project Manager: Katie O'Main

Initials: COJ Date: 12-13-17

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES	NO
3. Are Custody seals on sample containers intact?	NONE	<input checked="" type="radio"/> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ___ < green pea ___ > green pea	<input checked="" type="radio"/> N/A	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ___ dusting ___ moderate ___ heavy	N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		YES	<input checked="" type="radio"/> NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4		YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>			
Temperature (°C): <u>Am3</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>11</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES / NO / NA (If no, see Form 008.)			

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO /  NA Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Project Manager Signature / Date: Katie O'Main 12/18/17

March 6, 2018

Revision 1

ALS1712301

11-2

Page 1 of 1

1712301

ORIGIN ID: PSCA (509) 528-9426  
LESLY WALL  
CH2M  
6267 LATAH ST.  
6269 LATAH ST.  
RICHLAND, WA 99354  
UNITED STATES US

SHIP DATE: 12DEC17  
ACTWGT: 14.00 LB  
CAD: 107066051/NET3920

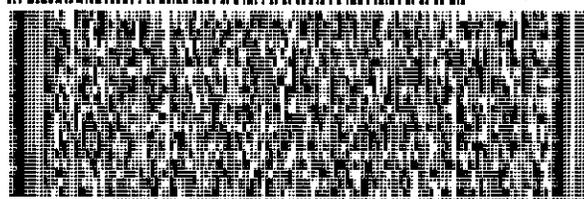
BILL THIRD PARTY

TO JULIE ELLINGSON  
ALS GLOBAL  
225 COMMERCE DRIVE

FORT COLLINS CO 80524

(970) 490-1511 REF: PTR# 8946/ COOLER# GWS-706  
INV: DEPT:  
PO:

649J1574C104C



FedEx Express



WED - 13 DEC 10:30A

PRIORITY OVERNIGHT

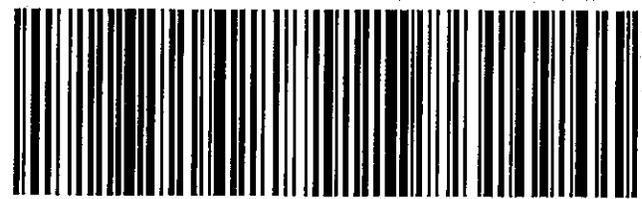
TRK# 7709 6915 4624  
0201

DSR

XH FTCA

80524

co-US DEN





# Metals

## Case Narrative

---

### **CH2M HILL Plateau Remediation Company**

RCRA, DECEMBER 2017 – W18-012

Work Order Number: 1712301

1. This report consists of 2 water samples for total recoverable and dissolved metals.
2. The samples were received intact at ambient temperature by ALS on 12/13/17.
3. The sample for dissolved metals had been filtered prior to receipt. All samples had a pH less than 2 upon receipt.
4. The samples were prepared and analyzed based on SW-846, 3<sup>rd</sup> Edition procedure.

For analysis by Trace ICP and ICP-MS, the samples were digested following method 3005A and the current revision of SOP 806.

For analysis by Cold Vapor AA (CVAA), the samples were digested following method 7470A and the current revision of SOP 812.

5. Analysis by Trace ICP followed method 6010B and the current revision of SOP 834.

Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.

Analysis by CVAA followed method 7470A and the current revision of SOP 812.

6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.



- A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in each digestion batch.
- The preparation (method) blank associated with each digestion batch was below the reporting limit for the requested analytes. Sample results have been compared to the blank results. Molybdenum was detected above the MDL.
- All laboratory control sample criteria were met.
- All initial and continuing calibration blanks were below the reporting limit for the requested analytes.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
- The interference check samples and high standard read-backs associated with Method 6010B were within acceptance criteria.
- The interference check samples associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

Sample 1712301-1 was designated as the quality control sample for each ICP analyses. Sample 1712301-2 was designated as the quality control sample for mercury analysis.

Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

- A matrix spike and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for accuracy were met.
- A serial dilution was analyzed with each ICP batch. All acceptance criteria were met with the following exception:

<u>Analyte</u>	<u>Sample ID</u>
Uranium	-1L

The associated sample results are flagged for serial dilution failure.

- 10. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 10X factor can be considered an artifact of the prep and does not indicate a secondary dilution and is therefore not flagged as a dilution.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Emily Lyons  
Emily Lyons  
Inorganics Primary Data Reviewer

1/2/18  
Date

Andie Elliza  
Inorganics Final Data Reviewer

1/2/18  
Date



### Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses:

- Result qualifier -- A “B” is entered if the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL). If the analyte was analyzed for but not detected a “U” is entered. For samples, negative values are reported as non-detects (“U” flagged). For blanks, if the absolute value of the negative value is above the MDL and below the reporting limit, then the result is “B” flagged.
- QC qualifier -- Specified entries and their meanings are as follows:
  - E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
  - M - Duplicate injection precision was not met.
  - N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
  - Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
  - \* - Duplicate analysis (relative percent difference) not within control limits.
  - S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.
  - C - The analyte was detected in both the sample and the associated QC blank, and the sample concentration was  $\leq 20X$  the blank concentration.
  - D - Analyte was reported at a secondary dilution factor, typically  $DF > 1$  (i.e., the primary preparation required dilution to either bring the analyte within the calibration range or to minimize interference). Required for organics/wetchem if the sample was diluted.

ALS1712301

# Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID:	B3FKB1
Lab ID:	1712301-1

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 21-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-1  
 Run ID: IP171221-1A2  
 Cleanup: NONE  
 Basis: As Received  
 File Name:

Analyst: Amanda J. Lynn  
 Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7440-42-8	BORON	1	6.6	U	30	6.6
7440-70-2	CALCIUM	1	57000		1000	120
7439-89-6	IRON	1	97		50	17
7439-95-4	MAGNESIUM	1	16000		750	97
7440-09-7	POTASSIUM	1	7400		1000	150
7440-23-5	SODIUM	1	26000		500	110
7440-62-2	VANADIUM	1	23		10	0.98

Data Package ID: IP1712301-1

ALS1712301

# Dissolved ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID:	B3FKB6
Lab ID:	1712301-2

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 21-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-1  
 Run ID: IP171221-1A2  
 Cleanup: NONE  
 Basis: As Received  
 File Name:

Analyst: Amanda J. Lynn  
 Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7440-42-8	BORON	1	6.6	U	30	6.6
7440-70-2	CALCIUM	1	58000		1000	120
7439-89-6	IRON	1	64		50	17
7439-95-4	MAGNESIUM	1	16000		750	97
7440-09-7	POTASSIUM	1	7500		1000	150
7440-23-5	SODIUM	1	26000		500	110
7440-62-2	VANADIUM	1	23		10	0.98

Data Package ID: IP1712301-1

ALS1712301

# Total Recoverable ICPMS Metals

Method SW6020A

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID:	B3FKB1
Lab ID:	1712301-1

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 11-Dec-17

Date Extracted: 20-Dec-17

Date Analyzed: 29-Dec-17

Prep Method: SW3005 Rev A

Prep Batch: IP171220-4

QCBatchID: IP171220-4-4

Run ID: IM171229-10A5

Cleanup: NONE

Basis: As Received

File Name: 024SMPL\_

Analyst: Brent A. Stanfield

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

Analysis ReqCode: 6020\_METALS\_I

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7429-90-5	ALUMINUM	10	43	B	100	8.7
7440-36-0	ANTIMONY	10	0.28	B	1	0.049
7440-38-2	ARSENIC	10	8.3		2	1.6
7440-39-3	BARIUM	10	58		5	1.6
7440-41-7	BERYLLIUM	10	0.25	B	0.5	0.081
7440-43-9	CADMIUM	10	0.09	B	2	0.062
7440-47-3	CHROMIUM	10	30		10	0.82
7440-48-4	COBALT	10	0.82	B	5	0.16
7440-50-8	COPPER	10	10		8	1.6
7439-92-1	LEAD	10	1	B	2	0.096
7439-96-5	MANGANESE	10	3.6	B	5	0.32
7439-98-7	MOLYBDENUM	10	4.1		2	0.15
7440-02-0	NICKEL	10	18	B	20	0.81
7782-49-2	SELENIUM	10	6.2	B	10	0.18
7440-22-4	SILVER	10	0.04	B	0.5	0.023
7440-24-6	STRONTIUM	10	300		5	0.12
7440-28-0	THALLIUM	10	0.015	U	0.1	0.015
7440-29-1	THORIUM	10	0.05	B	0.2	0.014
7440-31-5	TIN	10	1.3	B	10	0.73
7440-61-1	URANIUM	10	5.9	, E	0.1	0.022
7440-66-6	ZINC	10	6.7	B	100	3.5

Data Package ID: IM1712301-1

ALS1712301

# Dissolved ICPMS Metals

Method SW6020A

Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID:	B3FKB6
Lab ID:	1712301-2

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 11-Dec-17

Date Extracted: 20-Dec-17

Date Analyzed: 29-Dec-17

Prep Method: SW3005 Rev A

Prep Batch: IP171220-4

QCBatchID: IP171220-4-4

Run ID: IM171229-10A5

Cleanup: NONE

Basis: As Received

File Name: 029SMPL\_

Analyst: Brent A. Stanfield

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

Analysis ReqCode: 6020\_METALS\_I

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
7429-90-5	ALUMINUM	10	9.5	B	100	8.7
7440-36-0	ANTIMONY	10	0.27	B	1	0.049
7440-38-2	ARSENIC	10	7.4		2	1.6
7440-39-3	BARIUM	10	56		5	1.6
7440-41-7	BERYLLIUM	10	0.081	U	0.5	0.081
7440-43-9	CADMIUM	10	0.062	U	2	0.062
7440-47-3	CHROMIUM	10	5.5	B	10	0.82
7440-48-4	COBALT	10	0.16	U	5	0.16
7440-50-8	COPPER	10	11		8	1.6
7439-92-1	LEAD	10	3.2		2	0.096
7439-96-5	MANGANESE	10	1.1	B	5	0.32
7439-98-7	MOLYBDENUM	10	3.3		2	0.15
7440-02-0	NICKEL	10	8.7	B	20	0.81
7782-49-2	SELENIUM	10	5.5	B	10	0.18
7440-22-4	SILVER	10	0.023	U	0.5	0.023
7440-24-6	STRONTIUM	10	290		5	0.12
7440-28-0	THALLIUM	10	0.015	U	0.1	0.015
7440-29-1	THORIUM	10	0.014	U	0.2	0.014
7440-31-5	TIN	10	0.73	U	10	0.73
7440-61-1	URANIUM	10	3.7		0.1	0.022
7440-66-6	ZINC	10	3.8	B	100	3.5

Data Package ID: IM1712301-1

# Dissolved MERCURY

## Method SW7470A

### Sample Results

**Lab Name:** ALS -- Fort Collins  
**Client Name:** CH2M HILL Plateau Remediation Company  
**Client Project ID:** RCRA, DECEMBER 2017 W18-012  
**Work Order Number:** 1712301      **Final Volume:** 20 ml  
**Reporting Basis:** As Received      **Matrix:** WATER  
**Analyst:** Christina H. Williams      **Result Units:** UG/L

---

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Flag	Sample Aliquot
B3FKB6	1712301-2	12/11/2017	12/21/2017	12/21/2017	N/A	1	0.06	0.2	0.06	U	20 ml

**Comments:**

---

1. ND or U = Not Detected at or above the client requested detection limit.

**Data Package ID:** *HG1712301-1*

# Total Recoverable MERCURY

## Method SW7470A

### Sample Results

**Lab Name:** ALS -- Fort Collins  
**Client Name:** CH2M HILL Plateau Remediation Company  
**Client Project ID:** RCRA, DECEMBER 2017 W18-012  
**Work Order Number:** 1712301      **Final Volume:** 20 ml  
**Reporting Basis:** As Received      **Matrix:** WATER  
**Analyst:** Christina H. Williams      **Result Units:** UG/L

---

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Flag	Sample Aliquot
B3FKB1	1712301-1	12/11/2017	12/21/2017	12/21/2017	N/A	1	0.06	0.2	0.06	U	20 ml

**Comments:**

---

1. ND or U = Not Detected at or above the client requested detection limit.

**Data Package ID:** *HG1712301-1*

---

ALS1712301

ICP Metals

Method SW6010B

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: IP171220-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 20-Dec-17

Date Analyzed: 21-Dec-17

Prep Batch: IP171220-4

QCBatchID: IP171220-4-1

Run ID: IP171221-1A2

Cleanup: NONE

Basis: N/A

File Name:

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
7440-42-8	BORON	1	6.6	U	30	6.6
7440-70-2	CALCIUM	1	120	U	1000	120
7439-89-6	IRON	1	17	U	50	17
7439-95-4	MAGNESIUM	1	97	U	750	97
7440-09-7	POTASSIUM	1	150	U	1000	150
7440-23-5	SODIUM	1	110	U	500	110
7440-62-2	VANADIUM	1	0.98	U	10	0.98

Data Package ID: IP1712301-1

ALS1712301

ICP Metals

Method SW6010B

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: IP171220-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12/20/2017

Date Analyzed: 12/21/2017

Prep Method: SW3005A

Prep Batch: IP171220-4

QCBatchID: IP171220-4-1

Run ID: IP171221-1A2

Cleanup: NONE

Basis: N/A

File Name:

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-42-8	BORON	1000	986	30		99	80 - 120%
7440-70-2	CALCIUM	40000	37400	1000		93	80 - 120%
7439-89-6	IRON	1000	1010	50		101	80 - 120%
7439-95-4	MAGNESIUM	40000	36700	750		92	80 - 120%
7440-09-7	POTASSIUM	40000	40000	1000		100	80 - 120%
7440-23-5	SODIUM	40000	42300	500		106	80 - 120%
7440-62-2	VANADIUM	500	491	10		98	80 - 120%

Data Package ID: IP1712301-1

ALS1712301

ICP Metals

Method SW6010B

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID: B3FKB1
LabID: 1712301-1MS

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 21-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-1  
 Run ID: IP171221-1A2  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name:

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-42-8	BORON	6.6	U	942		30	1000	94	80 - 120%
7440-70-2	CALCIUM	57000		94600		1000	40000	93	80 - 120%
7439-89-6	IRON	97		1170		50	1000	107	80 - 120%
7439-95-4	MAGNESIUM	16000		53700		750	40000	94	80 - 120%
7440-09-7	POTASSIUM	7400		46400		1000	40000	98	80 - 120%
7440-23-5	SODIUM	26000		65900		500	40000	99	80 - 120%
7440-62-2	VANADIUM	23		503		10	500	96	80 - 120%

Field ID: B3FKB1
LabID: 1712301-1MSD

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 21-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-1  
 Run ID: IP171221-1A2  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name:

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-42-8	BORON	941		1000	94	30	20	0
7440-70-2	CALCIUM	94300		40000	92	1000	20	0
7439-89-6	IRON	1080		1000	98	50	20	8
7439-95-4	MAGNESIUM	54000		40000	95	750	20	1
7440-09-7	POTASSIUM	47700		40000	101	1000	20	3
7440-23-5	SODIUM	67500		40000	103	500	20	2
7440-62-2	VANADIUM	498		500	95	10	20	1

Data Package ID: IP1712301-1

**Prep Batch ID: IP171220-4**

Start Date: 12/20/17	End Date: 12/20/17	Concentration Method: NONE	Batch Created By: jml
Start Time: 15:45	End Time: 18:00	Extract Method: SW3005A	Date Created: 12/20/17
Prep Analyst: Jill M. Latelle		Initial Volume Units: ml	Time Created: 15:45
<b>Comments:</b>		Final Volume Units: ml	Validated By: jml
			Date Validated: 12/20/17
			Time Validated: 16:28

QC Batch ID: IP171220-4-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP171220-4	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
IP171220-4	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
1712301-1	MS	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	MSD	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	DUP	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	SMP	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-2	SMP	B3FKB6	WATER	12/11/2017	50	50	NONE	1	1712301

**QC Types**

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicat
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standar	SMP	Field Sample
SYS	Sample Yield Spike		

ALS1712301

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: IP171220-4MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 20-Dec-17

Date Analyzed: 29-Dec-17

Prep Batch: IP171220-4

QCBatchID: IP171220-4-4

Run ID: IM171229-10A5

Cleanup: NONE

Basis: N/A

File Name: 009SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
7429-90-5	ALUMINUM	10	8.7	U	100	8.7
7440-36-0	ANTIMONY	10	0.049	U	1	0.049
7440-38-2	ARSENIC	10	1.6	U	2	1.6
7440-39-3	BARIUM	10	1.6	U	5	1.6
7440-41-7	BERYLLIUM	10	0.081	U	0.5	0.081
7440-43-9	CADMIUM	10	0.062	U	2	0.062
7440-47-3	CHROMIUM	10	0.82	U	10	0.82
7440-48-4	COBALT	10	0.16	U	5	0.16
7440-50-8	COPPER	10	1.6	U	8	1.6
7439-92-1	LEAD	10	0.096	U	2	0.096
7439-96-5	MANGANESE	10	0.32	U	5	0.32
7439-98-7	MOLYBDENUM	10	0.16	B	2	0.15
7440-02-0	NICKEL	10	0.81	U	20	0.81
7782-49-2	SELENIUM	10	0.18	U	10	0.18
7440-22-4	SILVER	10	0.023	U	0.5	0.023
7440-24-6	STRONTIUM	10	0.12	U	5	0.12
7440-28-0	THALLIUM	10	0.015	U	0.1	0.015
7440-29-1	THORIUM	10	0.014	U	0.2	0.014
7440-31-5	TIN	10	0.73	U	10	0.73
7440-61-1	URANIUM	10	0.022	U	0.1	0.022
7440-66-6	ZINC	10	3.5	U	100	3.5

Data Package ID: IM1712301-1

ALS1712301

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: IM171220-4LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12/20/2017

Date Analyzed: 12/29/2017

Prep Method: SW3005A

Prep Batch: IP171220-4

QCBatchID: IP171220-4-4

Run ID: IM171229-10A5

Cleanup: NONE

Basis: N/A

File Name: 010SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7429-90-5	ALUMINUM	5000	4420	100		88	80 - 120%
7440-36-0	ANTIMONY	30	28.5	1		95	80 - 120%
7440-38-2	ARSENIC	100	91.7	2		92	80 - 120%
7440-39-3	BARIUM	100	90.7	5		91	80 - 120%
7440-41-7	BERYLLIUM	50	44.4	0.5		89	80 - 120%
7440-43-9	CADMIUM	30	31.2	2		104	80 - 120%
7440-47-3	CHROMIUM	500	452	10		90	80 - 120%
7440-48-4	COBALT	100	89.7	5		90	80 - 120%
7440-50-8	COPPER	1000	891	8		89	80 - 120%
7439-92-1	LEAD	50	44.3	2		89	80 - 120%
7439-96-5	MANGANESE	100	88.2	5		88	80 - 120%
7439-98-7	MOLYBDENUM	100	89.7	2		90	80 - 120%
7440-02-0	NICKEL	500	482	20		96	80 - 120%
7782-49-2	SELENIUM	100	94.6	10		95	80 - 120%
7440-22-4	SILVER	10	8.12	0.5		81	80 - 120%
7440-24-6	STRONTIUM	100	87.7	5		88	80 - 120%
7440-28-0	THALLIUM	2	1.78	0.1		89	80 - 120%
7440-29-1	THORIUM	10	9.67	0.2		97	80 - 120%
7440-31-5	TIN	500	424	10		85	80 - 120%
7440-61-1	URANIUM	10	10	0.1		100	80 - 120%
7440-66-6	ZINC	2000	1850	100		93	80 - 120%

Data Package ID: IM1712301-1

ALS1712301

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID: B3FKB1
LabID: 1712301-1MS

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 29-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-4  
 Run ID: IM171229-10A5  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 027SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7429-90-5	ALUMINUM	43	B	4740		100	5000	94	75 - 125%
7440-36-0	ANTIMONY	0.28	B	30.7		1	30	101	75 - 125%
7440-38-2	ARSENIC	8.3		103		2	100	95	75 - 125%
7440-39-3	BARIUM	58		150		5	100	92	75 - 125%
7440-41-7	BERYLLIUM	0.25	B	48.3		0.5	50	96	75 - 125%
7440-43-9	CADMIUM	0.09	B	31.8		2	30	106	75 - 125%
7440-47-3	CHROMIUM	30		492		10	500	92	75 - 125%
7440-48-4	COBALT	0.82	B	93.4		5	100	93	75 - 125%
7440-50-8	COPPER	10		944		8	1000	93	75 - 125%
7439-92-1	LEAD	1	B	50.9		2	50	100	75 - 125%
7439-96-5	MANGANESE	3.6	B	96.6		5	100	93	75 - 125%
7439-98-7	MOLYBDENUM	4.1		97.9		2	100	94	75 - 125%
7440-02-0	NICKEL	18	B	510		20	500	98	75 - 125%
7782-49-2	SELENIUM	6.2	B	104		10	100	97	75 - 125%
7440-22-4	SILVER	0.04	B	8.37		0.5	10	83	75 - 125%
7440-24-6	STRONTIUM	300		382		5	100	83	75 - 125%
7440-28-0	THALLIUM	0.015	U	1.92		0.1	2	96	75 - 125%
7440-29-1	THORIUM	0.05	B	9.98		0.2	10	99	75 - 125%
7440-31-5	TIN	1.3	B	464		10	500	93	75 - 125%
7440-61-1	URANIUM	5.9		13.6		0.1	10	78	75 - 125%
7440-66-6	ZINC	6.7	B	1960		100	2000	98	75 - 125%

Data Package ID: IM1712301-1

ALS1712301

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID: B3FKB1
LabID: 1712301-1MSD

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 11-Dec-17  
 Date Extracted: 20-Dec-17  
 Date Analyzed: 29-Dec-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP171220-4  
 QCBatchID: IP171220-4-4  
 Run ID: IM171229-10A5  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 028SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7429-90-5	ALUMINUM	4650		5000	92	100	20	2
7440-36-0	ANTIMONY	31.2		30	103	1	20	2
7440-38-2	ARSENIC	106		100	98	2	20	3
7440-39-3	BARIUM	151		100	93	5	20	1
7440-41-7	BERYLLIUM	48		50	96	0.5	20	1
7440-43-9	CADMIUM	32.9		30	109	2	20	3
7440-47-3	CHROMIUM	506		500	95	10	20	3
7440-48-4	COBALT	94.8		100	94	5	20	1
7440-50-8	COPPER	957		1000	95	8	20	1
7439-92-1	LEAD	52		50	102	2	20	2
7439-96-5	MANGANESE	96		100	92	5	20	1
7439-98-7	MOLYBDENUM	99.5		100	95	2	20	2
7440-02-0	NICKEL	507		500	98	20	20	1
7782-49-2	SELENIUM	105		100	99	10	20	1
7440-22-4	SILVER	8.65		10	86	0.5	20	3
7440-24-6	STRONTIUM	385		100	87	5	20	1
7440-28-0	THALLIUM	2.05		2	102	0.1	20	7
7440-29-1	THORIUM	10.8		10	108	0.2	20	8
7440-31-5	TIN	461		500	92	10	20	1
7440-61-1	URANIUM	14		10	81	0.1	20	3
7440-66-6	ZINC	2010		2000	100	100	20	2

Data Package ID: IM1712301-1

**Prep Batch ID: IP171220-4**

**Start Date:** 12/20/17

**End Date:** 12/20/17

**Concentration Method:** NONE

**Batch Created By:** jml

**Start Time:** 15:45

**End Time:** 18:00

**Extract Method:** SW3005A

**Date Created:** 12/20/17

**Prep Analyst:** Jill M. Latelle

**Initial Volume Units:** ml

**Time Created:** 15:45

**Comments:**

**Final Volume Units:** ml

**Validated By:** jml

**Date Validated:** 12/20/17

**Time Validated:** 16:28

**QC Batch ID:** IP171220-4-4

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP171220-4	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
IM171220-4	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
1712301-1	MS	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	MSD	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	DUP	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-1	SMP	B3FKB1	WATER	12/11/2017	50	50	NONE	1	1712301
1712301-2	SMP	B3FKB6	WATER	12/11/2017	50	50	NONE	1	1712301

**QC Types**

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicat
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standar	SMP	Field Sample
SYS	Sample Yield Spike		

ALS1712301

# Mercury

Method SW7470A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: HG171221-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 21-Dec-17

Date Analyzed: 21-Dec-17

Prep Batch: HG171221-1

QCBatchID: HG171221-1-2

Run ID: HG171221-1A2

Cleanup: NONE

Basis: N/A

File Name: HG171221-1

Sample Aliquot: 20 ml

Final Volume: 20 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
7439-97-6	MERCURY	1	0.06	U	0.2	0.06

Data Package ID: HG1712301-1

ALS1712301

**Mercury**

Method SW7470A

**Laboratory Control Sample**

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Lab ID: HG171221-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12/21/2017

Date Analyzed: 12/21/2017

Prep Method: METHOD

Prep Batch: HG171221-1

QCBatchID: HG171221-1-2

Run ID: HG171221-1A2

Cleanup: NONE

Basis: N/A

File Name: HG171221-1

Sample Aliquot: 20 ml

Final Volume: 20 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7439-97-6	MERCURY	1	0.99	0.2		99	80 - 120%

Data Package ID: *HG1712301-1*

ALS1712301

**Mercury**

Method SW7470A

**Matrix Spike And Matrix Spike Duplicate**

Lab Name: ALS -- Fort Collins

Work Order Number: 1712301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: RCRA, DECEMBER 2017 W18-012

Field ID: B3FKB6

LabID: 1712301-2MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 11-Dec-17

Date Extracted: 21-Dec-17

Date Analyzed: 21-Dec-17

Prep Method: METHOD

Prep Batch: HG171221-1

QCBatchID: HG171221-1-2

Run ID: HG171221-1A2

Cleanup: NONE

Basis: As Received

Sample Aliquot: 20 ml

Final Volume: 20 ml

Result Units: UG/L

File Name: HG171221-1

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7439-97-6	MERCURY	0.06	U	1.93		0.2	2	97	80 - 120%

Field ID: B3FKB6

LabID: 1712301-2MSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 11-Dec-17

Date Extracted: 21-Dec-17

Date Analyzed: 21-Dec-17

Prep Method: METHOD

Prep Batch: HG171221-1

QCBatchID: HG171221-1-2

Run ID: HG171221-1A2

Cleanup: NONE

Basis: As Received

Sample Aliquot: 20 ml

Final Volume: 20 ml

Result Units: UG/L

File Name: HG171221-1

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7439-97-6	MERCURY	2.01		2	101	0.2	20	4

Data Package ID: HG1712301-1

