

Monday, June 20, 2016

Dave Todak  
CH2M HILL Plateau Remediation Company  
2420 Stevens Center  
Richland, WA 99352

Re: ALS Workorder: 1606301  
Project Name: FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis-Wa  
Project Number: F16-025

Dear Mr. Todak:

One water sample was received from CH2M HILL Plateau Remediation Company, on 6/16/2016. The sample was 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

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

---

**OrderNum:** 1606301  
**Client Name:** CH2M HILL Plateau Remediation Company  
**Client Project Name:** FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis-  
**Client Project Number:** F16-025  
**Client PO Number:** BOA 54854

---

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B34TP4	1606301-1		WATER	14-Jun-16	12:38

CH2MHill Plateau Remediation Company  
 COLLECTOR: Kauer/CHPRC  
 CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST  
 PROJECT COORDINATOR: TODAY, D  
 TELEPHONE NO.: 376-6427  
 PRICE CODE: 7A  
 SAFETY: 7A  
 AIR QUALITY:   
 METHOD OF SHIPMENT: FEDERAL EXPRESS  
 BILL OF LADING/AIR BILL NO.: 7765 26771981  
 PROJECT DESIGNATION: F2016 200-UP-1 Remedial Action Wells Sampling and Analysis - Water  
 FIELD LOGBOOK NO.: HNF-N-645 4-L2 3/7.23  
 OFFSITE PROPERTY NO.: 67291  
 ACTUAL SAMPLE DEPTH: 3/7.23  
 SHIPPED TO: ALS Environmental Ft. Collins  
 MATRIX\*: A=Air, DL=Drum, Liquids, DS=Drum, Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other  
 POSSIBLE SAMPLE HAZARDS/REMARKS: \*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. NA  
 SPECIAL HANDLING AND/OR STORAGE:   
 SAMPLE NO.: B34TP4  
 MATRIX\*: WATER  
 FILTER

DATE/TIME	REMOVED FROM	REMOVED TO	DATE/TIME	REMOVED FROM	REMOVED TO
JUN 14 2016 1330	SSU-1	SSU-1	JUN 14 2016 1330	SSU-1	SSU-1
JUN 15 2016 0840	Lesly West	Lesly West	JUN 15 2016 0840	Lesly West	Lesly West
JUN 15 2016 1400	Fedex	Fedex	JUN 15 2016 1400	Fedex	Fedex

CH2MHill Plateau Remediation Company  
 COMPANY CONTACT: TODAY, D  
 PROJECT COORDINATOR: TODAY, D  
 TELEPHONE NO.: 376-6427  
 PRICE CODE: 7A  
 SAFETY: 7A  
 AIR QUALITY:   
 METHOD OF SHIPMENT: FEDERAL EXPRESS  
 BILL OF LADING/AIR BILL NO.: 7765 26771981  
 PROJECT DESIGNATION: F2016 200-UP-1 Remedial Action Wells Sampling and Analysis - Water  
 FIELD LOGBOOK NO.: HNF-N-645 4-L2 3/7.23  
 OFFSITE PROPERTY NO.: 67291  
 ACTUAL SAMPLE DEPTH: 3/7.23  
 SHIPPED TO: ALS Environmental Ft. Collins  
 MATRIX\*: A=Air, DL=Drum, Liquids, DS=Drum, Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other  
 POSSIBLE SAMPLE HAZARDS/REMARKS: \*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. NA  
 SPECIAL HANDLING AND/OR STORAGE:   
 SAMPLE NO.: B34TP4  
 MATRIX\*: WATER  
 FILTER

DATE/TIME	REMOVED FROM	REMOVED TO	DATE/TIME	REMOVED FROM	REMOVED TO
JUN 14 2016 1330	SSU-1	SSU-1	JUN 14 2016 1330	SSU-1	SSU-1
JUN 15 2016 0840	Lesly West	Lesly West	JUN 15 2016 0840	Lesly West	Lesly West
JUN 15 2016 1400	Fedex	Fedex	JUN 15 2016 1400	Fedex	Fedex



ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1606301

Project Manager: JE

Initials: JM Date: 6/16/16

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 of sediment: ___ dusting ___ moderate ___ heavy	N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		<input checked="" type="radio"/> YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 <input checked="" type="radio"/> #4		<input checked="" type="radio"/> YES	NO
Cooler #: <u>1</u>			
Temperature (°C): <u>1.8°C</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>12</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: [Signature] 6/16/16

Form 201r24.xls (06/04/2012) \*IR Gun #2: Oakton, SN 29922500201-0066 \*IR Gun #4: Oakton, SN 2372220101-0002

180

ORIGIN ID: PSCA (509) 528-9426  
LESLY WALL  
CH 2M  
6267 LATAH ST.  
6269 LATAH ST.  
RICHLAND, WA 99354  
UNITED STATES US

SHIP DATE: 15 JUN 16  
ACTWGT: 19.00 LB  
CAD: 10706605/INET3730

1606301

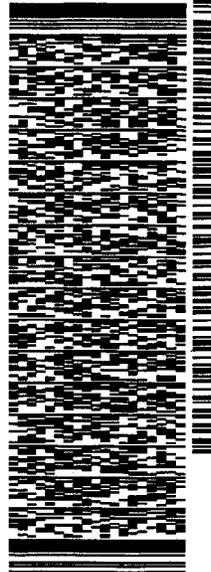
TO JULIE ELLINGSON  
ALS GLOBAL  
225 COMMERCE DRIVE

FORT COLLINS CO 80524  
(970) 490-1511 REF: PTR# 6729

PO: DEPT:

12  
-2

540.0260BD/727F



J101010020001uv

TRK# 7765 2677 1981  
0201

THU - 16 JUN 10:30A  
PRIORITY OVERNIGHT

XH FTCA

DSR 80524  
CO-US DEN



**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning:** Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on [fedex.com](http://fedex.com). FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



## Metals Case Narrative

---

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

FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis Water – F16-007

Work Order Number: 1606301

1. This report consists of 1 water sample.
2. The sample was received cool and intact by ALS on 06/16/16.
3. The sample was to be analyzed for dissolved metals. The sample had been filtered prior to receipt, and had a pH less than 2 upon receipt.
4. The sample was prepared and analyzed based on SW-846, 3<sup>rd</sup> Edition procedures.

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

5. Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time.

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 sample in this digestion batch.
  - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analytes. Sample results have been compared to the blank results.
  - 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 associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

Sample 1606301-1 was designated as the quality control sample for this 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 this batch. All acceptance criteria for accuracy were met.
- A serial dilution was analyzed with this ICP batch. All acceptance criteria were met.

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.

  
\_\_\_\_\_  
Jill Latelle  
Inorganics Primary Data Reviewer

6/20/16  
Date

  
\_\_\_\_\_  
Julie Elliza  
Inorganics Final Data Reviewer

6/20/16  
Date



### Inorganic Data Reporting Qualifiers

The following qualifiers are used as needed 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  $\leq 5X$  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.

# Dissolved ICPMS Metals

Method SW6020A

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1606301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis

Field ID:	B34TP4
Lab ID:	1606301-1

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 14-Jun-16  
Date Extracted: 17-Jun-16  
Date Analyzed: 20-Jun-16  
Prep Method: SW3005 Rev A

Prep Batch: IP160617-2  
QCBatchID: IP160617-2-4  
Run ID: IM160619-10A19  
Cleanup: NONE  
Basis: As Received  
File Name: 209SMPL\_

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	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	110	10	1.1		
7439-96-5	MANGANESE	10	34	5	0.3		

Data Package ID: *Im1606301-1*

6/20/2016  
ALS1606301

# ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1606301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis

Lab ID: IP160617-2MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 17-Jun-16

Date Analyzed: 20-Jun-16

Prep Batch: IP160617-2

QCBatchID: IP160617-2-4

Run ID: IM160619-10A19

Cleanup: NONE

Basis: N/A

File Name: 185SMPL\_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7440-47-3	CHROMIUM	10	1.1	10	1.1	U	
7439-96-5	MANGANESE	10	0.3	5	0.3	U	

Data Package ID: *Im1606301-1*

Date Printed: Monday, June 20, 2016

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.816

6/20/2016  
ALS1606301

# ICPMS Metals

Method SW6020A

## Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1606301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: FY2016 200-UP-1 Remedial Action Wells Sampling and Analysis

Lab ID: IM160617-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 06/17/2016

Date Analyzed: 06/20/2016

Prep Method: SW3005A

Prep Batch: IP160617-2

QCBatchID: IP160617-2-4

Run ID: IM160619-10A19

Cleanup: NONE

Basis: N/A

File Name: 186SMPL\_

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
7440-47-3	CHROMIUM	500	539	10		108	80 - 120%
7439-96-5	MANGANESE	100	109	5		109	80 - 120%

Data Package ID: *Im1606301-1*

# ICPMS Metals

Method SW6020A

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1606301

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: FY2016 200-UP-1 Remedial Action Wells Sampling and Anal

Field ID: B34TP4
LabID: 1606301-1MS

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 14-Jun-16  
Date Extracted: 17-Jun-16  
Date Analyzed: 20-Jun-16  
Prep Method: SW3005 Rev A

Prep Batch: IP160617-2  
QCBatchID: IP160617-2-4  
Run ID: IM160619-10A19  
Cleanup: NONE  
Basis: As Received

Sample Aliquot: 50 ml  
Final Volume: 50 ml  
Result Units: UG/L  
File Name: 212SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	110		656		10	500	110	75 - 125%
7439-96-5	MANGANESE	34		142		5	100	109	75 - 125%

Field ID: B34TP4
LabID: 1606301-1MSD

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 14-Jun-16  
Date Extracted: 17-Jun-16  
Date Analyzed: 20-Jun-16  
Prep Method: SW3005 Rev A

Prep Batch: IP160617-2  
QCBatchID: IP160617-2-4  
Run ID: IM160619-10A19  
Cleanup: NONE  
Basis: As Received

Sample Aliquot: 50 ml  
Final Volume: 50 ml  
Result Units: UG/L  
File Name: 213SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	652		500	109	10	20	1
7439-96-5	MANGANESE	141		100	108	5	20	1

Data Package ID: *Im1606301-1*