



July 12, 2017  
ALS1706281

Ft. Collins, Colorado

LIMS Version: 6.843

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Wednesday, July 12, 2017

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

Re: ALS Workorder: 1706281  
Project Name: SURV, JUNE 2017  
Project Number: S17-006

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 6/13/2017. 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  
Shiloh J. Summy  
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.

July 12, 2017

ALS1706281

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1706281

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

**Client Project Name:** SURV, JUNE 2017

**Client Project Number:** S17-006

**Client PO Number:** BOA 54854

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B39TN8	1706281-1		WATER	12-Jun-17	9:31
B39TP2	1706281-2		WATER	12-Jun-17	9:31

CH2M Hill Plateau Remediation  
Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

S17-006-052

Page 1 of 1

Collector: Roger Friesz Jr. /CHPRC  
 SAF No.: S17-006  
 Project Title: SURV, JUNE 2017  
 Shipped To (Lab): ALS Environmental Ft. Collins  
 Protocol: SURV

Contact/Requester: Karen Waters-Husted  
 Telephone No.: 509-376-4650  
 Sampling Origin: Hanford Site  
 Logbook No.: HNF-N-506 92 / 91  
 Method of Shipment: Commercial Carrier  
 Priority: 30 Days

Purchase Order/Charge Code: 300071  
 Ice Chest No.: CWS-631  
 Bill of Lading/Air Bill No.: 29279235314  
 Offsite Property No.: 8029

**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

Sample No.	Filter	Date	No/Type Container	Sample Analysis	Holding Time	Preservative
B39TN8	N	6-12-17 0931	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B39TP2	Y	6-12-17 0931	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2

**SPECIAL INSTRUCTIONS**  
 Hold Time: N/A

Total Activity Exemption: Yes  No

Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time	Matrix *
Roger Friesz Jr. /CHPRC			Janelle Zunker /CHPRC			JUN 12 2017 1111	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, WO = Oil, A = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
Janelle Zunker /CHPRC			Janelle Zunker /CHPRC			JUN 12 2017 1111	
Janelle Zunker /CHPRC			Janelle Zunker /CHPRC			6/17/17 1400	
Janelle Zunker /CHPRC			Janelle Zunker /CHPRC			6/17/17 0900	

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

DATE/TIME

FRS ID = FSR44300

PRINTED ON 4/26/2017

A-6004-842 (REV 2)



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: CHPCC  
Project Manager: \_\_\_\_\_

Workorder No: 1706281  
Initials: JNS Date: 6/13/17

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 of sediment: ___ dusting ___ moderate ___ heavy	Amount <input checked="" type="radio"/> 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	RAD ONLY	YES	<input checked="" type="radio"/> NO
Cooler #: <u>1</u>			
Temperature (°C): <u>amb</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>10</u>			
Background µR/hr reading: <u>10</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> 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: \_\_\_\_\_

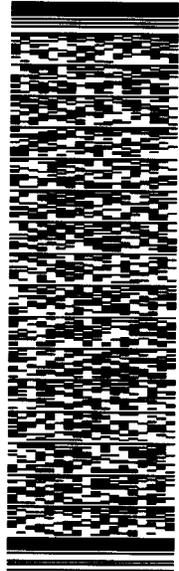
**Project Manager Signature / Date:** Charles Jimmy 6/13/17

ORIGIN ID: PSCA (509) 373-3580  
JANELLE ZUNKER  
CH2M  
6269 LATAH ST.  
RICHLAND, WA 99354  
UNITED STATES US

SHIP DATE: 12 JUN 17  
ACT WT: 8.00 LB  
CAD: 107066051INET3850  
BILL THIRD PARTY

TO JULIE ELLINGSON  
ALS GLOBAL  
225 COMMERCE DRIVE

FORT COLLINS CO 80524  
(970) 490-1511 REF: 8029  
NV DEPT  
PC

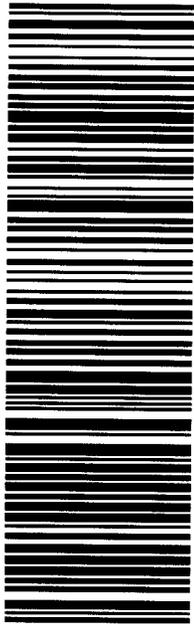


J17117021401ur

546J1/A50253C1

TRK# 7793 7923 5314  
0201  
TUE - 13 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.

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1706281



## Metals Case Narrative

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

**SURV, JUNE 2017 – S17-006**

Work Order Number: 1706281

1. This report consists of 2 water samples.
2. The samples were received intact at ambient temperature by ALS on 06/13/17.
3. The 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 procedures.

For analysis by ICP-MS, the samples were 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 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 this digestion batch.
  - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analyte. 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 analyte.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analyte.
- The interference check samples associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

Sample 1706281-1 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.

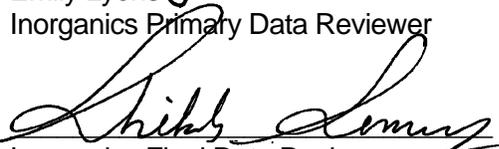
- A matrix spike and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for accuracy were met.
- A serial dilution was analyzed with each ICP batch. All acceptance criteria were met.

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.

  
\_\_\_\_\_  
Emily Lyons  
Inorganics Primary Data Reviewer

7/10/17  
Date

  
\_\_\_\_\_  
Keith Loney  
Inorganics Final Data Reviewer

7/12/17  
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  $\leq 20X$  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.

## Dissolved CHROMIUM

Method SW6020A

### Sample Results

**Lab Name:** ALS -- Fort Collins  
**Client Name:** CH2M HILL Plateau Remediation Company  
**Client Project ID:** SURV, JUNE 2017 S17-006  
**Work Order Number:** 1706281      **Final Volume:** 50 ml  
**Reporting Basis:** As Received      **Matrix:** WATER  
**Analyst:** Brent A. Stanfield      **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
B39TP2	1706281-2	6/12/2017	6/21/2017	06/29/2017	N/A	10	16	10	3		50 ml

**Comments:**

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

**Data Package ID:** *IM1706281-1*

# Total Recoverable CHROMIUM

Method SW6020A

## Sample Results

Lab Name: ALS -- Fort Collins  
Client Name: CH2M HILL Plateau Remediation Company  
Client Project ID: SURV, JUNE 2017 S17-006  
Work Order Number: 1706281      Final Volume: 50 ml  
Reporting Basis: As Received      Matrix: WATER  
Analyst: Brent A. Stanfield      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
B39TN8	1706281-1	6/12/2017	6/21/2017	06/29/2017	N/A	10	16	10	3		50 ml

**Comments:**

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

**Data Package ID:** *IM1706281-1*

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# ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1706281

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, JUNE 2017 S17-006

Lab ID: IP170621-11MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 21-Jun-17

Date Analyzed: 29-Jun-17

Prep Batch: IP170621-11

QCBatchID: IP170621-11-3

Run ID: IM170628-10A6

Cleanup: NONE

Basis: N/A

File Name: 210SMPL\_

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
7440-47-3	CHROMIUM	10	3	U	10	3

Data Package ID: IM1706281-

Date Printed: Friday, July 07, 2017

ALS -- Fort Collins

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# ICPMS Metals

Method SW6020A

## Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1706281

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, JUNE 2017 S17-006

Lab ID: IM170621-11LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 06/21/2017

Date Analyzed: 06/29/2017

Prep Method: SW3005A

Prep Batch: IP170621-11

QCBatchID: IP170621-11-3

Run ID: IM170628-10A6

Cleanup: NONE

Basis: N/A

File Name: 211SMPL\_

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	492	10		98	80 - 120%

Data Package ID: IM1706281-1

Date Printed: Friday, July 07, 2017

ALS -- Fort Collins

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ALS1706281

# ICPMS Metals

Method SW6020A

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1706281

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: SURV, JUNE 2017 S17-006

Field ID: B39TN8
LabID: 1706281-1MS

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 12-Jun-17  
 Date Extracted: 21-Jun-17  
 Date Analyzed: 29-Jun-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP170621-11  
 QCBatchID: IP170621-11-3  
 Run ID: IM170628-10A6  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 228SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	16		516		10	500	100	75 - 125%

Field ID: B39TN8
LabID: 1706281-1MSD

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 12-Jun-17  
 Date Extracted: 21-Jun-17  
 Date Analyzed: 29-Jun-17  
 Prep Method: SW3005 Rev A

Prep Batch: IP170621-11  
 QCBatchID: IP170621-11-3  
 Run ID: IM170628-10A6  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 229SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	509		500	98	10	20	1

Data Package ID: IM1706281-1

**Prep Batch ID: IP170621-11**

Start Date: 06/21/17	End Date: 06/21/17	Concentration Method: NONE	Batch Created By: ajl2
Start Time: 11:27	End Time: 18:00	Extract Method: SW3005A	Date Created: 06/21/17
Prep Analyst: Amanda J. Lynn		Initial Volume Units: ml	Time Created: 11:27
<b>Comments:</b>		Final Volume Units: ml	Validated By: ajl2
			Date Validated: 06/21/17
			Time Validated: 11:57

QC Batch ID: IP170621-11-3

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP170621-11	MB	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1706281
IM170621-11	LCS	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1706281
1706281-1	MS	B39TN8	WATER	6/12/2017	50	50	NONE	1	1706281
1706281-1	MSD	B39TN8	WATER	6/12/2017	50	50	NONE	1	1706281
1706281-1	DUP	B39TN8	WATER	6/12/2017	50	50	NONE	1	1706281
1706281-1	SMP	B39TN8	WATER	6/12/2017	50	50	NONE	1	1706281
1706281-2	SMP	B39TP2	WATER	6/12/2017	50	50	NONE	1	1706281

**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		