

Wednesday, June 22, 2016

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

Re: ALS Workorder: 1606327  
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 6/17/2016. The sample was scheduled for the following analysis:

Metals

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

This report was originally submitted on 6/21/16. It is being submitted with a different metals list.

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

## Priority Problem and Discrepancy Report

ALS

SDG ALS1606327

06/22/2016

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The data package has the following issues:

- Manganese and uranium are reported but manganese and chromium were requested.

**Resolution:** *Provide correction.*

**Lab Response:** Remove uranium and add chromium to report.

Please correct the issue and resubmit the hard copy and electronic copy data packages.

Provide a resolution to each issue noted on the report

Page 1 of 1

# ALS Environmental -- FC

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 1606327

**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

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B34TP9	1606327-1		WATER	15-Jun-16	11:53





ALS Environmental - Fort Collins  
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1606327

Project Manager: JE

Initials: RM

Date: 6/17/16

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	Amount 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>11</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.

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

Project Manager Signature / Date: *JE* 6/17/16

ORIGIN ID: PSCA (509) 373-3580  
JANELLE ZUNKER  
CH2M  
6289 LATAH ST.  
RICHLAND WA 99354  
UNITED STATES US

SHIP DATE: 16 JUN 16  
ACT WT: 15.00 LB  
CAD: 10706805/INET/3730

1606327

BILL THIRD PARTY

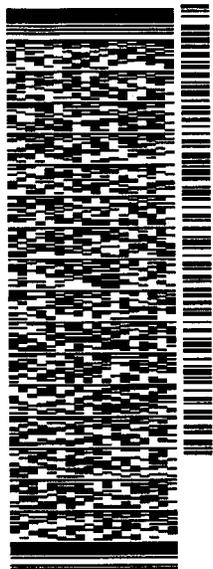
TO JULIE ELLINGSON  
ALS GLOBAL  
225 COMMERCE DRIVE

FORT COLLINS CO 80524

(970) 490-1511 REF: 6740  
NV/ PO: DEPT:

10-2

540.0230BD/727F



J16101602805100

TRK# 7765 4182 0538  
0201  
FRI - 17 JUN 10:30A  
PRIORITY OVERNIGHT

XH FTCA  
DSR 80524  
CO-US DEN



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# Metals

## Case Narrative

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

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

Work Order Number: 1606327

1. This report consists of 1 water sample.
2. The sample was received intact at ambient temperature by ALS on 06/17/16.
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. Manganese has results above the MDL. 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 1606327-1 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.

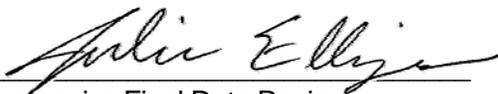
- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A serial dilution was analyzed with this ICP batch. All acceptance criteria were met.

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

6/22/16  
Date

  
\_\_\_\_\_  
Julie Elljes  
Inorganics Final Data Reviewer

6/22/16  
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: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Field ID:	B34TP9
Lab ID:	1606327-1

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 15-Jun-16  
Date Extracted: 20-Jun-16  
Date Analyzed: 20-Jun-16  
Prep Method: SW3005 Rev A

Prep Batch: IP160620-1  
QC Batch ID: IP160620-1-4  
Run ID: IM160620-11A11  
Cleanup: NONE  
Basis: As Received  
File Name: 121SMPL\_

Analyst: Brent A. Stanfield  
Sample Aliquot: 50 ml  
Final Volume: 50 ml  
Result Units: UG/L  
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7439-96-5	MANGANESE	10	23	5	0.3		

Data Package ID: *im1606327-1*

# Dissolved ICPMS Metals

Method SW6020A

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Field ID:	B34TP9
Lab ID:	1606327-1

Sample Matrix: WATER  
% Moisture: N/A  
Date Collected: 15-Jun-16  
Date Extracted: 20-Jun-16  
Date Analyzed: 20-Jun-16  
Prep Method: SW3005 Rev A

Prep Batch: IP160620-1  
QC Batch ID: IP160620-1-6  
Run ID: IM160620-11A14  
Cleanup: NONE  
Basis: As Received  
File Name: 121SMPL\_

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	28	10	1.1		

Data Package ID: *im1606327-2*

ALS1606327\_R1

## ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Lab ID: IP160620-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 20-Jun-16

Date Analyzed: 20-Jun-16

Prep Batch: IP160620-1

QCBatchID: IP160620-1-4

Run ID: IM160620-11A11

Cleanup: NONE

Basis: N/A

File Name: 109SMPL\_

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
7439-96-5	MANGANESE	10	0.38	5	0.3	B	

Data Package ID: im1606327-1

6/22/2016

REV.1

ALS1606327\_R1

# ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Lab ID: IP160620-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 20-Jun-16

Date Analyzed: 20-Jun-16

Prep Batch: IP160620-1

QCBatchID: IP160620-1-6

Run ID: IM160620-11A14

Cleanup: NONE

Basis: N/A

File Name: 109SMPL\_

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	

Data Package ID: im1606327-2

ALS1606327\_R1

## ICPMS Metals

Method SW6020A

## Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Lab ID: IM160620-1LCS

Sample Matrix: WATER

Prep Batch: IP160620-1

Sample Aliquot: 50 ml

% Moisture: N/A

QCBatchID: IP160620-1-4

Final Volume: 50 ml

Date Collected: N/A

Run ID: IM160620-11A11

Result Units: UG/L

Date Extracted: 06/20/2016

Cleanup: NONE

Clean DF: 1

Date Analyzed: 06/20/2016

Basis: N/A

Prep Method: SW3005A

File Name: 110SMPL\_

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7439-96-5	MANGANESE	100	109	5		109	80 - 120%

Data Package ID: im1606327-1

ALS1606327\_R1

## ICPMS Metals

Method SW6020A

## Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Lab ID: IM160620-1LCS

Sample Matrix: WATER

Prep Batch: IP160620-1

Sample Aliquot: 50 ml

% Moisture: N/A

QCBatchID: IP160620-1-6

Final Volume: 50 ml

Date Collected: N/A

Run ID: IM160620-11A14

Result Units: UG/L

Date Extracted: 06/20/2016

Cleanup: NONE

Clean DF: 1

Date Analyzed: 06/20/2016

Basis: N/A

Prep Method: SW3005A

File Name: 110SMPL\_

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-47-3	CHROMIUM	500	545	10		109	80 - 120%

Data Package ID: *im1606327-2*

ALS1606327\_R1

## ICPMS Metals

Method SW6020A

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Field ID: B34TP9	Sample Matrix: WATER	Prep Batch: IP160620-1	Sample Aliquot: 50 ml
LabID: 1606327-1MS	% Moisture: N/A	QCBatchID: IP160620-1-4	Final Volume: 50 ml
	Date Collected: 15-Jun-16	Run ID: IM160620-11A11	Result Units: UG/L
	Date Extracted: 20-Jun-16	Cleanup: NONE	File Name: 124SMPL_
	Date Analyzed: 20-Jun-16	Basis: As Received	
	Prep Method: SW3005 Rev A		

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7439-96-5	MANGANESE	23		132		5	100	109	75 - 125%

Field ID: B34TP9	Sample Matrix: WATER	Prep Batch: IP160620-1	Sample Aliquot: 50 ml
LabID: 1606327-1MSD	% Moisture: N/A	QCBatchID: IP160620-1-4	Final Volume: 50 ml
	Date Collected: 15-Jun-16	Run ID: IM160620-11A11	Result Units: UG/L
	Date Extracted: 20-Jun-16	Cleanup: NONE	File Name: 125SMPL_
	Date Analyzed: 20-Jun-16	Basis: As Received	
	Prep Method: SW3005 Rev A		

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7439-96-5	MANGANESE	130		100	107	5	20	2

Data Package ID: im1606327-1

ALS1606327\_R1

## ICPMS Metals

Method SW6020A

## Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1606327

Client Name: CH2M HILL Plateau Remediation Company

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

Field ID: B34TP9
LabID: 1606327-1MS

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 15-Jun-16  
 Date Extracted: 20-Jun-16  
 Date Analyzed: 20-Jun-16  
 Prep Method: SW3005 Rev A

Prep Batch: IP160620-1  
 QCBatchID: IP160620-1-6  
 Run ID: IM160620-11A14  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 124SMPL\_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-47-3	CHROMIUM	28		577		10	500	110	75 - 125%

Field ID: B34TP9
LabID: 1606327-1MSD

Sample Matrix: WATER  
 % Moisture: N/A  
 Date Collected: 15-Jun-16  
 Date Extracted: 20-Jun-16  
 Date Analyzed: 20-Jun-16  
 Prep Method: SW3005 Rev A

Prep Batch: IP160620-1  
 QCBatchID: IP160620-1-6  
 Run ID: IM160620-11A14  
 Cleanup: NONE  
 Basis: As Received

Sample Aliquot: 50 ml  
 Final Volume: 50 ml  
 Result Units: UG/L  
 File Name: 125SMPL\_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-47-3	CHROMIUM	568		500	108	10	20	1

Data Package ID: *im1606327-2*