



Sunday, December 31, 2017

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

Re: ALS Workorder: 1712275
Project Name: AEA, DECEMBER 2017
Project Number: I18-003

Dear Ms. Waters-Husted:

One water sample was received from CH2M HILL Plateau Remediation Company, on 12/12/2017. 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

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.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1712275

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: AEA, DECEMBER 2017

Client Project Number: I18-003

Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3FFN7	1712275-1		WATER	08-Dec-17	12:27

1110117

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C.# I18-003-024	Page 1 of 1
CH2MHill Plateau Remediation Company		Telephone No.: 509-376-4650	
Collector: Daniel King CHPRC	Contact/Requester: Karen Waters-Husted	Purchase Order/Charge Code: 300071	
SAF No.: I18-003	Sampling Origin: Hanford Site	Ice Chest No.: GWS-475	
Project Title: AEA, DECEMBER 2017	Logbook No.: HNF-N-506 * 97/31	Bill of Lading/Air Bill No.: 7709 55837576	
Shipped To (Lab): ALS Environmental Ft. Collins	Method of Shipment: Commercial Carrier	Offsite Property No.: 8840	
Protocol: SURV	Priority: 15 Days		
POSSIBLE SAMPLE HAZARDS/REMARK ** ** 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		SPECIAL INSTRUCTIONS N/A	
Sample No. B3FFN7	Filter * N	Time * DEC 08 2017 / 227	No/Type Container 1x500-mL G/P
Sample Analysis 6020_METALS_ICPMS: Uranium (1)		Holding Time 6 Months	Preservative HNO3 to pH <2

Relinquished By: Daniel King CHPRC	Signature	DEC 08 2017	Date/Time	1530	Received By: SSU-1	Signature	DEC 08 2017	Date/Time	1530	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By: Troy Bacon CHPRC	Signature	DEC 11 2017	Date/Time	0800	Received By: Troy Bacon	Signature	DEC 11 2017	Date/Time	0800	DS = Drum Solids DL = Drum Liquid T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By: Fedex	Signature	DEC 11 2017	Date/Time	1400	Received By: FEDEX	Signature		Date/Time		
Relinquished By: Kathy Soder	Signature	DEC 11 2017	Date/Time	1330	Received By: Kathy Soder	Signature	12-12-17	Date/Time	1700	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:						



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHARC Workorder No: 1712275
Project Manager: lw Initials: KS Date: 12-19-17

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		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>11</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? 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: lw 12/19/17

ORIGIN D/PSCA (509) 373-3580
JANELLE ZUNKER
CH2M
6289 LATAM ST.
RICHLAND, WA 99354
UNITED STATES US

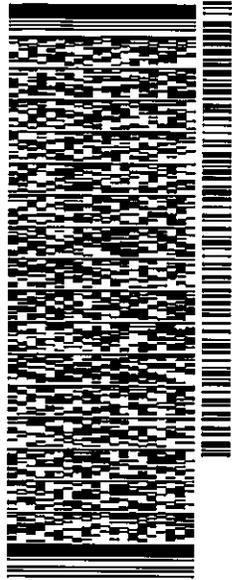
SHIP DATE: 11DEC17
ACTWGT: 8.00 LB
CAD: 1070680571NET3920
BILL THIRD PARTY

TO **JULIE ELLINGSON**
ALS GLOBAL
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(970) 490-1511 REF: 8840
INV.
PO. DEPT.

11-2

549J1574CH04C



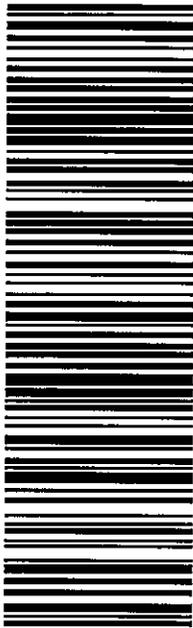
J172117891281uv

TRK# 7709 5583 7576
0201

TUE - 12 DEC 10:30A
PRIORITY OVERNIGHT
DSR

XH FTCA

80524
CO-US DEN



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M2222



Metals

Case Narrative

CH2M HILL Plateau Remediation Company

AEA, DECEMBER 2017 – I18-003

Work Order Number: 1712275

1. This report consists of 1 water sample.
2. The sample was received intact at ambient temperature by ALS on 12/12/17.
3. The sample had a pH less than 2 upon receipt.
4. The sample was prepared and analyzed based on SW-846, 3rd 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 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 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 this analysis. Results for the shared quality control samples are included at the client's request.

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.

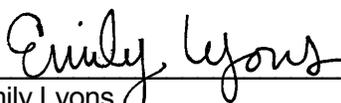
- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A serial dilution was analyzed with each ICP batch. All acceptance criteria were met with the following exception:

<u>Analyte</u>	<u>Sample ID</u>
Uranium	1712301-1L

The associated sample results are flagged for serial dilution failure.

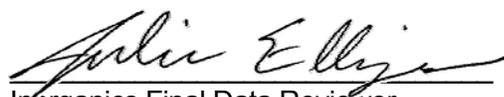
10. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 10X factor can be considered an artifact of the prep and does not indicate a secondary dilution and is therefore not flagged as a dilution.

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
Inorganics Primary Data Reviewer

12/31/17
Date



Julie Ellinger
Inorganics Final Data Reviewer

12/31/17
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.

Total Recoverable URANIUM

Method SW6020A

Sample Results

Lab Name: ALS -- Fort Collins
Client Name: CH2M HILL Plateau Remediation Company
Client Project ID: AEA, DECEMBER 2017 I18-003
Work Order Number: 1712275 **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
B3FFN7	1712275-1	12/8/2017	12/20/2017	12/29/2017	N/A	10	14	0.1	0.022		50 ml

Comments:

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

Data Package ID: *IM1712275-1*

ALS1712275

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1712275

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA, DECEMBER 2017 I18-003

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: IP171220-4-3

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
7440-61-1	URANIUM	10	0.022	U	0.1	0.022

Data Package ID: IM1712275-1

ALS1712275

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1712275

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA, DECEMBER 2017 I18-003

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: IP171220-4-3

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
7440-61-1	URANIUM	10	10	0.1		100	80 - 120%

Data Package ID: IM1712275-1

ALS1712275

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1712275

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: AEA, DECEMBER 2017 I18-003

Field ID: SHARED QC

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: IP171220-4-3

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
7440-61-1	URANIUM	5.9		13.6		0.1	10	78	75 - 125%

Field ID: SHARED QC

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: IP171220-4-3

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
7440-61-1	URANIUM	14		10	81	0.1	20	3

Data Package ID: IM1712275-1

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: IP171220-4-3

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	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
1712301-1	MSD	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
1712301-1	DUP	XXXXXX	WATER	XXXXXX	50	50	NONE	1	1712301
1712275-1	SMP	B3FFN7	WATER	12/8/2017	50	50	NONE	1	1712275
1712301-1	SMP	XXXXXX	WATER	XXXXXX	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		