

July 29, 2016
ALS1607276



Ft. Collins, Colorado

LIMS Version: 6.820

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Friday, July 29, 2016

Karen Waters-Husted
CH2M HILL Plateau Remediation Company
2420 Stevens Center
Richland, WA 99352

Re: ALS Workorder: 1607276
Project Name: LLWMA-1 AND LLWMA-4 PA, JULY
Project Number: A16-006

Dear Ms. Waters-Husted:

Two water samples were received from CH2M HILL Plateau Remediation Company, on 7/15/2016. 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,

A handwritten signature in black ink, appearing to read "Julie Ellingson".

ALS Environmental
Julie Ellingson
Project Manager

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Environmental

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ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

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ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1607276

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: LLWMA-1 AND LLWMA-4 PA, JULY

Client Project Number: A16-006

Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B35RJ6	1607276-1		WATER	14-Jul-16	11:40
B35RJ5	1607276-2		WATER	14-Jul-16	7:40

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1607276		C.O.C. # A16-006-002
Collector Kevin Patterson CHPRC	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	Page 1 of 1	
SAF No. A16-006	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071		
Project Title LLWMA-1 AND LLWMA-4 PA, JULY	Logbook No. HNF-N-50685194	Ice Chest No. GWS-SSS		
Shipped To (Lab) ALS Environmental Ft. Collins	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 776749088892		
Protocol SURV	Priority: 30 Days	Offsite Property No. 6838	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
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. B35RJ6 ①	Filter N	Date W JUL 14 2016	Time 1140	No/Type Container 1x500-mL G/P
SPECIAL INSTRUCTIONS N/A Special Handling: N/A		Hold Time	Holding Time 6 Months	Preservative HNO3 to pH <2
Sample Analysis 6020_METALS_ICPMS: Uranium (1)				

Relinquished By Kevin Patterson CHPRC	Print 	Sign	Received By J.C. Fulton CHPRC	Print 	Date/Time JUL 14 2016 1150	Matrix *
Relinquished By J.C. Fulton CHPRC	Print 	Sign	Received By FEDEX	Print 	Date/Time JUL 14 2016 1400	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge W = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By 40	Print 	Sign	Received By C. Timblec	Print 	Date/Time 7-15-16 0930	
Relinquished By 40	Print 	Sign	Received By	Print	Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C.# A16-006-001
Collector Kevin Patterson CHPRC		Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	Page 1 of 1
SAF No. A16-006	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071		
Project Title LLWMA-1 AND LLWMA-4 PA, JULY	Logbook No. HNF-N-506 85194	Ice Chest No. 725-555		
Shipped To (Lab) ALS Environmental Ft. Collins	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 77674908 8892		
Protocol SURV	Priority: 30 Days	Offsite Property No. 6838	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
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. B35R15	Filter N	Date JUL 14 2016	Time 0740	Hold Time 6 Months
No/Type Container 1x500-mL G/P		Sample Analysis 6020_METALS_ICPMS: Uranium (1)		Preservative HNO3 to pH <2

Relinquished By Kevin Patterson CHPRC	Print 	Sign	Received By J.C. Fulton CHPRC	Sign 	Date/Time JUL 14 2016 1150	Matrix * S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By J.C. Fulton CHPRC	Print 	Sign	Received By FEDEX	Sign	Date/Time JUL 14 2016 1400	Matrix * DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By CED EX	Print 	Sign	Received By ATM ble C...	Sign	Date/Time 7-15-16 0930	
Relinquished By	Print	Sign	Received By	Sign	Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time

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ALS Environmental - Fort Collins

CONDITION OF SAMPLE UPON RECEIPT FORM



Client: CHPRC

Workorder No: 1607276

Project Manager: JK

Initials: CDT Date: 7-15-16

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>4.2</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>13</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.

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

Project Manager Signature / Date: JK 7/19/16



Metals Case Narrative

CH2M HILL Plateau Remediation Company

LLWMA-1 AND LLWMA-4 PA, JULY -- A16-006

Work Order Number: 1607276

1. This report consists of 2 water samples.
2. The samples were received intact at ambient temperature by ALS on 07/15/16.
3. The samples had a pH less than 2 upon receipt.
4. The samples were prepared and analyzed based on SW-846, 3rd 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 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 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 result.
 - 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 1607299-4 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 matrix spike duplicate was digested and analyzed with this batch. All acceptance criteria for precision 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 10X dilution. This dilution factor can be considered an artifact of the prep, and does not indicate a secondary dilution. Therefore, it is 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 Knodel
Inorganics Primary Data Reviewer

7/28/16
Date



Julie Elliza
Inorganics Final Data Reviewer

7/28/16
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 $\leq 20X$ 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: LLWMA-1 AND LLWMA-4 PA, JULY A16-006
Work Order Number: 1607276 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
B35RJ6	1607276-1	7/14/2016	7/22/2016	07/25/2016	N/A	10	5.1	0.1	0.027		50 ml
B35RJ5	1607276-2	7/14/2016	7/22/2016	07/25/2016	N/A	10	0.027	0.1	0.027	U	50 ml

Comments:

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

Data Package ID: IM1607276-1

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ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS -- Fort Collins

Work Order Number: 1607276

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: LLWMA-1 AND LLWMA-4 PA, JULY A16-006

Lab ID: IP160722-1MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 22-Jul-16

Date Analyzed: 25-Jul-16

Prep Batch: IP160722-1

QCBatchID: IP160722-1-2

Run ID: IM160725-12A3

Cleanup: NONE

Basis: N/A

File Name: 063SMPL_

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
7440-61-1	URANIUM	10	0.027	0.1	0.027	U	

Data Package ID: IM1607276-1

Date Printed: Thursday, July 28, 2016

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ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS -- Fort Collins

Work Order Number: 1607276

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: LLWMA-1 AND LLWMA-4 PA, JULY A16-006

Lab ID: IM160722-1LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07/22/2016

Date Analyzed: 07/25/2016

Prep Method: SW3005A

Prep Batch: IP160722-1

QCBatchID: IP160722-1-2

Run ID: IM160725-12A3

Cleanup: NONE

Basis: N/A

File Name: 064SMPL_

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	10.8	0.1		108	80 - 120%

Data Package ID: IM1607276-1

Date Printed: Thursday, July 28, 2016

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ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS -- Fort Collins

Work Order Number: 1607276

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: LLWMA-1 AND LLWMA-4 PA, JULY A16-006

Field ID: SHARED QC

LabID: 1607299-4MS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 15-Jul-16

Date Extracted: 22-Jul-16

Date Analyzed: 25-Jul-16

Prep Method: SW3005 Rev A

Prep Batch: IP160722-1

QCBatchID: IP160722-1-2

Run ID: IM160725-12A3

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 075SMPL_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-61-1	URANIUM	12		22.4		0.1	10	104	75 - 125%

Field ID: SHARED QC

LabID: 1607299-4MSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 15-Jul-16

Date Extracted: 22-Jul-16

Date Analyzed: 25-Jul-16

Prep Method: SW3005 Rev A

Prep Batch: IP160722-1

QCBatchID: IP160722-1-2

Run ID: IM160725-12A3

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 076SMPL_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-61-1	URANIUM	22.4		10	103	0.1	20	0

Data Package ID: IM1607276-1