Ft. Collins, Colorado

LIMS Version: 6.907

Saturday, September 14, 2019

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

Re: ALS Workorder: 1908422
Project Name: Apatite Barrier, September 201
Project Number: I19-029

Dear Ms. Waters-Husted:

One water sample was received from CH2M HILL Plateau Remediation Company, on 8/20/2019. The sample was scheduled for the following analysis:

Inorganics

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

This report was originally submitted on August 25, 2019. The report has been revised to replace the J flags with B flags.

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
Katie M. OBrien
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, any 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.

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ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1908422
Client Name: CH2M HILL Plateau Remediation Company
Client Project Name: Apatite Barrier, September 201
Client Project Number: I19-029
Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B3R5V6	1908422-1		WATER	19-Aug-19	8:02

CH2MHill Plateau Remediation Company	12 LBS.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 1908422	C.O.C. # I19-029-027 Page 1 of 1

Collector: Juan Aguilar /CHPRC	**Contact/Requester:** Karen Waters-Husted	**Telephone No.:** 509-376-4650
SAF No.: I19-029	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 303064
Project Title: Apatite Barrier, September 201	**Logbook No.:** HNF-N-506-103146	**Ice Chest No.:** GWS-707
Shipped To (Lab): ALS Environmental Ft. Collins	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 7760 2117 0663
Protocol: CERCLA	**Priority:** 30 Days	**Offsite Property No.:** 11475

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.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3R5V6 (1)	N	W	8-19-19	0802	1x125-mL P	300.0_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By			Received By		
Print First and Last Name	Signature	Date/Time	Print First and Last Name	Signature	Date/Time
Juan Aguilar /CHPRC		AUG 19 2019 1015	Lesly Wall /CHPRC	Lesly Wall	AUG 19 2019 1015
Lesly Wall /CHPRC	Lesly Wall FEDEX	1400 AUG 19 2019	FEDEX	FEDEX	
			Erik Evans	Erik E	8/20/19 0400

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

ALS1908422 Sept. 14, 2019 Rev. 1

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC Workorder No: 1908422

Project Manager: KMO Initials: EE Date: 8/20/19

1.	Are airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
2.	Are custody seals on **shipping** containers intact?	NONE	YES	NO *
3.	Are custody seals on **sample** containers intact?	NONE	YES	NO *
4.	Is there a COC (chain-of-custody) present?		YES	NO *
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		YES	NO *
6.	Are short-hold samples present?		YES	NO
7.	Are all samples within holding times for the requested analyses?		YES	NO *
8.	Were all sample containers received intact? (not broken or leaking)		YES	NO *
9.	Is there sufficient sample for the requested analyses?		YES	NO *
10.	Are all samples in the proper containers for the requested analyses?		YES	NO *
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	YES	NO *
12.	Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO *
13.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A	YES	NO
14.	Were the samples shipped on ice?		YES	NO
15.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	RAD ONLY	YES	NO

Cooler #:	1							
Temperature (°C):	5.8							
No. of custody seals on cooler:	2							
DOT Survey/ Acceptance Information — External µR/hr reading:	12							
Background µR/hr reading:	13							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)

*** Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

All client bottle ID's vs ALS lab ID's double-checked by: EE

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

Project Manager Signature / Date: 8/20/19

Form 201r27.xls
(02/11/2019)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

1908422

ORIGIN ID:PSCA (509) 531-0450
TROY BACON
CH2M
6267 LATAH ST.
RICHLAND, WA 99352
UNITED STATES US

SHIP DATE: 19AUG19
ACTWGT: 12.00 LB
CAD: 107068051/INET4100

BILL THIRD PARTY

TO JULIE ELLINGSON
ALS GLOBAL-FORT COLLINS
225 COMMERCE DR
FORT COLLINS CO 80524
(970) 490-1511
INV:
PO:
REF: PTR#11475
DEPT:

12-2

5.8°C

567J3/E9E7/05A2

FedEx Express

J1020100634091mm

TUE - 20 AUG 10:30A
PRIORITY OVERNIGHT
DSR
80524
CO-US DEN

TRK# 0201 7760 2117 0663

XH FTCA

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Inorganics

Case Narrative

CH2M HILL Plateau Remediation Company

Apatite Barrier, September 201 -- I19-029

Work Order Number: 1908422

1. The sample was prepared for analysis based on Environmental Monitoring Systems Laboratory (EMSL) Rev 2.1 procedures.

2. The sample was analyzed following EMSL procedures for the current revisions of the following SOPs and methods:

Analyte	Method	SOP #
Chloride	300.0 Revision 2.1	1113
Fluoride	300.0 Revision 2.1	1113
Nitrate as N	300.0 Revision 2.1	1113
Nitrite as N	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

3. All standards and solutions were used within their recommended shelf life.

4. The sample was prepared and analyzed within the established hold time for this analysis except Nitrate as N and Nitrite as N which were analyzed outside of hold time.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.

   - A preparation (method) blank, laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) were prepared and analyzed with the sample in this preparation batch.

   - The method blank associated with this batch was below the reporting limit for the requested analytes. Sample results have been compared to the blank results and are flagged as appropriate.

   - 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.

6. Matrix specific quality control procedures.

   Sample 1908366-7 was designated as the quality control sample for this analysis. Results for the shared quality control samples from the batch 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 (MS) was prepared and analyzed with this batch. All guidance criteria for precision and accuracy were met.

7. It was necessary to dilute the sample in order to bring the anion concentrations into the analytical range of the ion chromatograph.

8. Manual integrations are performed when needed to provide consistent and defensible data following the guidelines in the current revision of SOP 939.

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.

Melinda Greubel — 9/11/19
Melinda Greubel — Date
Inorganics Primary Data Reviewer

Kath M. — 9/14/19
Inorganics Final Data Reviewer — Date

Inorganic Data Reporting Qualifiers

The following qualifiers are used as needed by the laboratory when reporting results of inorganic analyses.

- Concentration 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 ALS’s Method Detection Limit. If the analyte was analyzed for but not detected a “U” is entered.

- 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 <=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.

Ion Chromatography

Method EPA300.0 Revision 2.1

Sample Results

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1908422
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: Apatite Barrier, September 201 I19-029

Field ID: B3R5V6
Lab ID: 1908422-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 19-Aug-19
Date Extracted: 20-Aug-19
Date Analyzed: 20-Aug-19
Prep Method: NONE

Prep Batch: IC190820-3
QCBatchID: IC190820-3-1
Run ID: IC190820-1A2
Cleanup: NONE
Basis: As Received
File Name: 190820ic3lims

Analyst: Lainey M. Lloyd
Sample Aliquot: 5 ml
Final Volume: 5 ml
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Result Qualifier	Reporting Limit	MDL
16984-48-8	FLUORIDE AnalysisTime: 20:02	2	0.11	BD	0.2	0.06
16887-00-6	CHLORIDE AnalysisTime: 20:15	10	58	D	2	0.6
14797-65-0	NITRITE AS N AnalysisTime: 20:02	2	0.06	UD	0.2	0.06
14797-55-8	NITRATE AS N AnalysisTime: 20:02	2	15	D	0.4	0.12
14808-79-8	SULFATE AnalysisTime: 20:02	2	110	D	2	0.6

Data Package ID: *IC1908422-1*

Ion Chromatography

Method EPA300.0 Revision 2.1

Method Blank

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1908422
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: Apatite Barrier, September 201 I19-029

Lab ID: IC190820-3MB

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 20-Aug-19
Date Analyzed: 20-Aug-19

Prep Batch: IC190820-3
QCBatchID: IC190820-3-1
Run ID: IC190820-1A2
Cleanup: NONE
Basis: N/A
File Name: 190820ic3lims

Sample Aliquot: 5 ml
Final Volume: 5 ml
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	DF	Result	Result Qualifier	Reporting Limit	MDL
16984-48-8	FLUORIDE	1	0.03	U	0.1	0.03
16887-00-6	CHLORIDE	1	0.06	U	0.2	0.06
14797-65-0	NITRITE AS N	1	0.04	B	0.1	0.03
14797-55-8	NITRATE AS N	1	0.06	U	0.2	0.06
14808-79-8	SULFATE	1	0.3	U	1	0.3

Data Package ID: *IC1908422-1*

Ion Chromatography

Method EPA300.0 Revision 2.1

Laboratory Control Sample and Laboratory Control Sample Duplicate

Lab Name: ALS -- Fort Collins
Work Order Number: 1908422
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: Apatite Barrier, September 201 I19-029

Lab ID: IC190820-3LCS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 08/20/2019
Date Analyzed: 08/20/2019
Prep Method: NONE

Prep Batch: IC190820-3
QCBatchID: IC190820-3-1
Run ID: IC190820-1A2
Cleanup: NONE
Basis: N/A
File Name: 190820ic3lims

Sample Aliquot: 5 ml
Final Volume: 5 ml
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
16984-48-8	FLUORIDE	5	5.05	0.1		101	90 - 110%
16887-00-6	CHLORIDE	10	10	0.2		100	90 - 110%
14797-65-0	NITRITE AS N	5	5.13	0.1		103	90 - 110%
14797-55-8	NITRATE AS N	10	10	0.2		100	90 - 110%
14808-79-8	SULFATE	50	50.4	1		101	90 - 110%

Lab ID: IC190820-3LCSD

Sample Matrix: WATER
% Moisture: N/A
Date Collected: N/A
Date Extracted: 08/20/2019
Date Analyzed: 08/20/2019
Prep Method: NONE

Prep Batch: IC190820-3
QCBatchID: IC190820-3-1
Run ID: IC190820-1A2
Cleanup: NONE
Basis: N/A
File Name: 190820ic3lims

Sample Aliquot: 5 ml
Final Volume: 5 ml
Result Units: MG/L
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCSD Result	Reporting Limit	Result Qualifier	LCSD % Rec.	RPD Limit	RPD
16984-48-8	FLUORIDE	5	5	0.1		100	15	1
16887-00-6	CHLORIDE	10	10	0.2		100	15	0
14797-65-0	NITRITE AS N	5	5.12	0.1		102	15	0
14797-55-8	NITRATE AS N	10	9.98	0.2		100	15	0
14808-79-8	SULFATE	50	50	1		100	15	1

Data Package ID: *IC1908422-1*

Ion Chromatography

Method EPA300.0 Revision 2.1

Matrix Spike

Lab Name: **ALS -- Fort Collins**
Work Order Number: 1908422
Client Name: CH2M HILL Plateau Remediation Company
ClientProject ID: Apatite Barrier, September 201 I19-029

Field ID: SHARED QC
LabID: 1908366-7MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 15-Aug-19
Date Extracted: 20-Aug-19
Date Analyzed: 20-Aug-19

Prep Batch: IC190820-3
QCBatchID: IC190820-3-1
Run ID: IC190820-1A2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ml
Final Volume: 5 ml
Result Units: MG/L
File Name: 190820ic3lims

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
16984-48-8	FLUORIDE	0.069	B	1.95		0.1	2	94	85 - 115%
16887-00-6	CHLORIDE	0.84		5.61		0.2	5	95	85 - 115%
14797-65-0	NITRITE AS N	100	U	2200		100	2000	110	85 - 115%
14797-55-8	NITRATE AS N	200	U	4820		200	5000	96	85 - 115%
14808-79-8	SULFATE	18		34.5		1	20	85	85 - 115%

Data Package ID: *IC1908422-1*

Prep Batch ID: IC190820-3

Start Date: 08/20/19
Start Time: 9:00
Prep Analyst: Lainey M. Lloyd

End Date: 08/20/19
End Time: 19:00

Concentration Method: NONE
Extract Method: NONE
Initial Volume Units: ml
Final Volume Units: ml

Batch Created By: lml
Date Created: 08/20/19
Time Created: 9:59
Validated By: kjs
Date Validated: 08/21/19
Time Validated: 10:58

Comments:

QC Batch ID: IC190820-3-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IC190820-3	MB	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
IC190820-3	LCS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
IC190820-3	LCSD	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-7	MS	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-1	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908366-7	SMP	XXXXXX	WATER	XXXXXX	5	5	NONE	1	1908366
1908422-1	SMP	B3R5V6	WATER	8/19/2019	5	5	NONE	1	1908422

QC Types

CAR	Carrier reference sample	DLS	Detection Limit Standard	
DUP	Laboratory Duplicate	LCS	Laboratory Control Sample	
LCSD	Laboratory Control Sample Duplicat	LODV	Limit of Detection Verification	
LOQV	Limit of Quantitation Verification	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	