TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-14931-1
TestAmerica Sample Delivery Group: SL2021
Client Project/Site: X15-054

For:
CH2M Hill Plateau Remediation Company
PO BOX 1600, MS H8-41
Richland, Washington 99352

Attn: Mr. Scot Fitzgerald

Authorized for release by:
11/27/2015 12:39:42 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 160-14931-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
November 27, 2015
Attention: Scot Fitzgerald

SDG	: SL2021
Number of Samples	: 1 sample
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: November 19, 2015

II. Introduction

On November 19, 1 sample was received by TestAmerica - St. Louis for chemical analysis. The samples were received within temperature criteria. See the COC and receipt checklists for documentation of any variations on receipt conditions and temperature. Upon receipt, samples were given laboratory Ids to correspond with specific client Ids. Please refer to the Sample Summary sheets attached to this case narrative. This report is incomplete without the narrative.

The following SAFs are associated with this SDG: X15-054

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits. All results are based upon samples as they were received, i.e. wet weight, unless otherwise noted on the data sheets. See the attached Methods Summary Form for the methods used in this SDG.

MS/MSD/Dup analysis was done per the client requirements. Analytical batches that did not contain matrix QC were analyzed with an LCS/LCS duplicate.

Note: For Metals analyses, per standard practice, all 6020 water and soil samples are initially prepared at 2x dilution. This standard dilution does not affect reporting limits as MDL studies are also prepared in the same manner. These dilutions do not necessitate flagging unless otherwise noted in the case narrative.

For Anion analysis, samples have been started at a 2x dilution per CHPRC direction. The samples are flagged accordingly with a “D” flag if sample concentration is above the MDL/RL. Non-conformance will be included in the below section only if dilution is greater than 2x.

For WTPH methods, the lab utilizes method 8015B. Per CHPRC direction, the method name in the electronic data has been modified to read WTPH in the place of 8015B.

Per CHPRC direction (June 2014), Boron will be reported for Metals using method 6010. Boron will no longer be reported by method 6020.

Per CHPRC direction, due to the short hold times for Nitrate, Nitrite and Phosphate by IC (48 hours) as well as pH analysis (24 hours), a SIR request is not needed when samples are run outside 1x hold but within 2x hold. A narrative comment will be included below if a sample is run outside the lab-specified hold time for waters.

Per CHPRC direction, data for pH analysis will be reported outside 1x 24 hour hold time due to this being a field parameter.

IV. Definitions

Job ID: 160-14931-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

QCBLK-	Quality Control Blank, Method Blank
QCLCS-	Quality Control Laboratory Control Sample, Blank Spike
DUP-	Laboratory Duplicate
MS-	Matrix Spike
MSD-	Matrix Spike Duplicate

The term "Detection Limit" used in the analytical data report refers to either the lab's standard reporting limits or contractually required reporting limits, whichever is applicable.

The following data qualifiers may be applicable to the results in this report, as appropriate.

- **B** - For inorganic analyses, the sample result is greater than the MDL but less than the RL.
- **B** - For organic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **J** - For organic analyses, the sample is estimated and less than the RL.
- **C** - For inorganic analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL.
- **D** - For all analyses, the sample result was obtained from the analysis of a dilution. For Metals analyses, per standard practice, all solid samples are initially prepared at a 2x dilution. This standard dilution does not affect reporting limits as MDL studies are also prepared in the same manner. These dilutions do not necessitate qualification unless otherwise noted in the case narrative.
- **N** - For inorganics and GC analyses, the spike/spike duplicate recoveries are outside QC limits.
- **T** - For GCMS analyses, the spike/spike duplicate recoveries are outside QC limits.
- **O**- For all analyses, the LCS (LCSD) recoveries are outside QC limits.
- **M**- For inorganic analyses, the precision was outside control limits.
- **P -** For organic analyses (PCB/Pests only), the aroclor target analyte has greater than 25% difference for detected concentrations between the two GC columns.

There were no observations or non-conformances associated with the following methods:

Cyanide

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 signature on this report.

Reviewed and approved:

Jayna Awalt
St. Louis Project Manager

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-14931-1
SDG Number: SL2021

Login Number: 14931
List Number: 1
Creator: Clarke, Jill C

List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.8°
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CH2MHill Plateau Remediation Company SL2021

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X15-054-015**

Collector	J.R. Aguilar/CHPRC	**Contact/Requester**	WATERS-HUSTED, K	**Telephone No.**	376-4650
SAF No.	X15-054	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	302869
Project Title	200-BP-5 Treatability Test - Week 4	**Logbook No.**	HNF-N-506 80 / 34	**Ice Chest No.**	GWS-330
Shipped To (Lab)	TestAmerica St. Louis	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7750 1033 3693
Protocol	CERCLA	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS

*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32JD3	N	W	11-18-15	0812	1x250-mL G/P	9012_CYANIDE: COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.R. Aguilar/CHPRC		NOV 18 2015	0845	F.M. Hall/CHPRC		NOV 18 2015	0845
F.M. Hall/CHPRC		NOV 18 2015 1400		FEDEX			
FEDEX		FED EX		Jill Clarke	Jill Clarke	11.19.15	0920

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

PRINTED ON 9/8/2015 **FSR ID = FSR3862** A-6004-842 (REV 2)

November 27, 2015

FedEx ® Tracking

775010333693

Ship date:
Wed 11/18/2015

RICHLAND, WA US

Delivered
Signed for by: J.CLARKE

Actual delivery:
Thu 11/19/2015 9:13 am

EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
- 11/19/2015 - Thursday		
9:13 am	Delivered	EARTH CITY, MO
7:12 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:05 am	At local FedEx facility	EARTH CITY, MO
5:18 am	At destination sort facility	BERKELEY, MO
4:29 am	Departed FedEx location	MEMPHIS, TN
12:25 am	Arrived at FedEx location	MEMPHIS, TN
- 11/18/2015 - Wednesday		
6:51 pm	Shipment information sent to FedEx	
5:11 pm	Left FedEx origin facility	PASCO, WA
3:23 pm	Picked up	PASCO, WA

Shipment Facts

Tracking number	775010333693	**Service**	FedEx Priority Overnight
Weight	65 lbs / 29.48 kgs	**Dimensions**	28x15x18 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	65 lbs / 29.48 kgs	**Shipper reference**	gws-330
Packaging	Your Packaging	**Special handling section**	Deliver Weekday, Additional Handling Surcharge

FedEx. Search Subm

Customer Focus
New Customer Center
Small Business Center
Service Guide
Customer Support

Company Information
About FedEx
Careers
Investor Relations

Featured Services
FedEx One Rate
FedEx SameDay
FedEx Home Delivery
Healthcare Solutions
Online Retail Solutions
Packaging Services
Ancillary Clearance Services

Other Resources
FedEx Compatible
Developer Resource Center
FedEx Ship Manager Software
FedEx Mobile

Companies
FedEx Express
FedEx Ground
FedEx Office
FedEx Freight
FedEx Custom Critical
FedEx Trade Networks
FedEx SupplyChain
FedEx TechConnect

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Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

Qualifiers

General Chemistry

Qualifier	Qualifier Description
U	Analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

Method	Method Description	Protocol	Laboratory
9012B	Cyanide, Total andor Amenable	SW846	TAL SL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-14931-1	B32JD3	Water	11/18/15 08:12	11/19/15 09:20

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

General Chemistry

Client Sample ID: B32JD3
Date Collected: 11/18/15 08:12
Date Received: 11/19/15 09:20

Lab Sample ID: 160-14931-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	351		5.0	2.9	ug/L		11/24/15 18:20	11/24/15 21:53	1

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 160-224116/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224293 — **Prep Batch: 224116**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	2.9	U	5.0	2.9	ug/L		11/24/15 18:20	11/24/15 21:29	1

Lab Sample ID: HLCS 160-224116/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224293 — **Prep Batch: 224116**

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	400	374.8		ug/L		94	85 - 115

Lab Sample ID: LCS 160-224116/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224293 — **Prep Batch: 224116**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	200	181.3		ug/L		91	85 - 115

Lab Sample ID: 160-14825-A-1-C MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224293 — **Prep Batch: 224116**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	309		200	516.3		ug/L		103	66 - 120

Lab Sample ID: 160-14825-A-1-B DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224293 — **Prep Batch: 224116**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cyanide, Total	309		331.5		ug/L		7	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: X15-054

TestAmerica Job ID: 160-14931-1
SDG: SL2021

General Chemistry

Prep Batch: 224116

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-14825-A-1-B DU	Duplicate	Total/NA	Water	9010C	
160-14825-A-1-C MS	Matrix Spike	Total/NA	Water	9010C	
160-14931-1	B32JD3	Total/NA	Water	9010C	
HLCS 160-224116/3-A	Lab Control Sample	Total/NA	Water	9010C	
LCS 160-224116/2-A	Lab Control Sample	Total/NA	Water	9010C	
MB 160-224116/1-A	Method Blank	Total/NA	Water	9010C	

Analysis Batch: 224293

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-14825-A-1-B DU	Duplicate	Total/NA	Water	9012B	224116
160-14825-A-1-C MS	Matrix Spike	Total/NA	Water	9012B	224116
160-14931-1	B32JD3	Total/NA	Water	9012B	224116
HLCS 160-224116/3-A	Lab Control Sample	Total/NA	Water	9012B	224116
LCS 160-224116/2-A	Lab Control Sample	Total/NA	Water	9012B	224116
MB 160-224116/1-A	Method Blank	Total/NA	Water	9012B	224116