

June 28, 2016

# 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: 160-17818-1

TestAmerica Sample Delivery Group: SL2220  
Client Project/Site: W16-006

For:

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

Attn: Mr. Scot Fitzgerald



Authorized for release by:  
6/28/2016 2:16:39 PM

Jayna Awalt, Project Manager II  
(314)298-8566  
[jayna.awalt@testamericainc.com](mailto:jayna.awalt@testamericainc.com)

### LINKS

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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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Case Narrative

Client: CH2M Hill Plateau Remediation Company  
Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
SDG: SL2220

Job ID: 160-17818-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2M Hill Plateau Remediation Company  
P.O. Box 1600  
Richland, Washington 99352  
June 28, 2016  
Attention: Scot Fitzgerald

SDG : SL2220  
Number of Samples : 4 samples  
Sample Matrix : Water  
Data Deliverable : Summary  
Date SDG Closed : June 16, 2016

II. Introduction

On June 16, 4 samples were 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: W16-006

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.

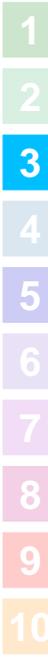
For solid matrices, all Metals analyses (including Hg) use a Standard Reference Material for the Laboratory Control Sample (LCS). Certificate for this source material may be obtained from TASL.

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.



## Case Narrative

Client: CH2M Hill Plateau Remediation Company  
Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
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### Job ID: 160-17818-1 (Continued)

#### Laboratory: TestAmerica St. Louis (Continued)

For extractable and volatile organic analyses, several analytes are considered poor performers and will not meet CHPRC QC limits. Per CHPRC direction, the lab's statistical limits have been reported. Excursions outside these statistical limits will include a non-conformance in the sections below.

#### IV. Definitions

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:

#### TOC

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: 160-17818-1  
SDG Number: SL2220

**Login Number: 17818**  
**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	0.2°
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 (excluding tests with immediate HTs)	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	

C.O.C.#  
**W16-006-139**  
Page 1 of 1

# CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

**CH2M Hill Plateau Remediation Company**  
S12220

Collector: Juan Aguilera *CHP/RC*  
 Contact/Requester: Karen Waters-Husted  
 Telephone No.: 509-376-4650  
 SAF No.: W16-006  
 Sampling Origin: Hanford Site  
 Purchase Order/Charge Code: 300071  
 Project Title: RCRA, JUNE 2016  
 Logbook No.: HNF-N-506 *86/27*  
 Ice Chest No.: *6WS-530*  
 Shipped To (Lab): TestAmerica St. Louis  
 Bill of Lading/Air Bill No.: *7765 2146 1580*  
 Protocol: RCRA  
 Method of Shipment: Commercial Carrier  
 Priority: **15 Days**  
 Offsite Property No.: *N/A*

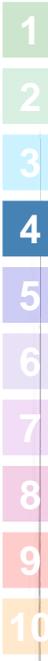
**POSSIBLE SAMPLE HAZARDS/REMARKS**  
 \*\*\* Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

**SPECIAL INSTRUCTIONS**  
 Hold Time: \_\_\_\_\_  
 Hold Time: \_\_\_\_\_  
 Hold Time: \_\_\_\_\_  
 Hold Time: \_\_\_\_\_  
 Total Activity Exemption: Yes  No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35Y88	N	W	<i>6-14-16</i>	<i>1218</i>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35Y89	N	W	<i>↓</i>	<i>↓</i>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35Y91	N	W	<i>↓</i>	<i>↓</i>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35Y90	N	W	<i>6-14-16</i>	<i>1218</i>	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Juan Aguilera	<i>CHP/RC</i>	<i>[Signature]</i>	JUN 14 2016 13:40	SSU #1			JUN 14 2016 13:40	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Oil, A = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
Juan Aguilera	<i>SSU-1</i>	<i>[Signature]</i>	JUN 15 2016 08:20	Lesly Wall / CHP/RC	<i>Lesly Wall</i>		JUN 15 2016 08:20	
Juan Aguilera	<i>SSU-1</i>	<i>[Signature]</i>	JUN 15 2016 14:06	JILL CLARKE	<i>Jill Clarke</i>		JUN 15 2016 08:55	
Juan Aguilera	<i>SSU-1</i>	<i>[Signature]</i>	JUN 15 2016 14:06	JILL CLARKE	<i>Jill Clarke</i>		JUN 15 2016 08:55	

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





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### FedEx® Tracking

776529461580

Ship date	Actual delivery
<b>Wed 6/15/2016</b>	<b>Thu 6/16/2016 8:52 am</b>
RICHLAND, WA US	<b>Delivered</b>
	EARTH CITY, MO US
	<i>Signed for by: B.DANIELS</i>

#### Travel History

Date/Time	Activity	Location
- 6/16/2016 - Thursday		
8:52 am	Delivered	EARTH CITY, MO
6:59 am	On FedEx vehicle for delivery	EARTH CITY, MO
6:53 am	At local FedEx facility	EARTH CITY, MO
5:10 am	At destination sort facility	BERKELEY, MO
4:22 am	Departed FedEx location	MEMPHIS, TN
12:34 am	Arrived at FedEx location	MEMPHIS, TN
- 6/15/2016 - Wednesday		
4:59 pm	Left FedEx origin facility	PASCO, WA
3:30 pm	Picked up	PASCO, WA
2:22 pm	Shipment information sent to FedEx	

#### Shipment Facts

<b>Tracking number</b>	776529461580	<b>Service</b>	FedEx Standard Overnight
<b>Weight</b>	67 lbs / 30.39 kgs	<b>Delivered To</b>	Shipping/Receiving
<b>Total pieces</b>	1	<b>Total shipment weight</b>	67 lbs / 30.39 kgs
<b>Terms</b>	Recipient	<b>Shipper reference</b>	GWS-530
<b>Packaging</b>	Your Packaging	<b>Special handling section</b>	Deliver Weekday, Additional Handling Surcharge



Search or tracking number | Subr

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 Small Business Center  
 Service Guide  
 Customer Support

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 Packaging Services  
 Ancillary Clearance Services

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 Developer Resource Center  
 FedEx Ship Manager Software  
 FedEx Mobile

**Companies**  
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 FedEx Office  
 FedEx Freight  
 FedEx Custom Critical  
 FedEx Trade Networks  
 FedEx CrossBorder  
 FedEx SupplyChain

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## Definitions/Glossary

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
 SDG: SL2220

### Qualifiers

#### General Chemistry

Qualifier	Qualifier Description
B	Estimated result. Result is less than the RL, but greater than MDL
U	Analyzed for but not detected.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: W16-006

TestAmerica Job ID: 160-17818-1  
SDG: SL2220

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Method	Method Description	Protocol	Laboratory
9060	Organic Carbon, Total (TOC)	SW846	TAL SL

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**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



June 28, 2016

## Sample Summary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
SDG: SL2220

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-17818-1	B35Y88	Water	06/14/16 12:18	06/16/16 08:55
160-17818-2	B35Y89	Water	06/14/16 12:18	06/16/16 08:55
160-17818-3	B35Y91	Water	06/14/16 12:18	06/16/16 08:55
160-17818-4	B35Y90	Water	06/14/16 12:18	06/16/16 08:55

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Client Sample Results

Client: CH2M Hill Plateau Remediation Company  
 Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
 SDG: SL2220

General Chemistry

Client Sample ID: B35Y88  
 Date Collected: 06/14/16 12:18  
 Date Received: 06/16/16 08:55

Lab Sample ID: 160-17818-1  
 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.86	B	1.0	0.72	mg/L			06/17/16 23:05	1

Client Sample ID: B35Y89  
 Date Collected: 06/14/16 12:18  
 Date Received: 06/16/16 08:55

Lab Sample ID: 160-17818-2  
 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.89	B	1.0	0.72	mg/L			06/17/16 23:40	1

Client Sample ID: B35Y91  
 Date Collected: 06/14/16 12:18  
 Date Received: 06/16/16 08:55

Lab Sample ID: 160-17818-3  
 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0		1.0	0.72	mg/L			06/17/16 23:52	1

Client Sample ID: B35Y90  
 Date Collected: 06/14/16 12:18  
 Date Received: 06/16/16 08:55

Lab Sample ID: 160-17818-4  
 Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.1		1.0	0.72	mg/L			06/18/16 00:03	1

QC Sample Results

Client: CH2M Hill Plateau Remediation Company  
Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
SDG: SL2220

Method: 9060 - Organic Carbon, Total (TOC)

Lab Sample ID: MB 160-257090/25  
Matrix: Water  
Analysis Batch: 257090

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.72	U	1.0	0.72	mg/L			06/17/16 22:32	1

Lab Sample ID: LCS 160-257090/26  
Matrix: Water  
Analysis Batch: 257090

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.68		mg/L		97	90 - 110

Lab Sample ID: 160-17818-1 MS  
Matrix: Water  
Analysis Batch: 257090

Client Sample ID: B35Y88  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.86	B	5.00	5.63		mg/L		96	76 - 120

Lab Sample ID: 160-17818-1 DU  
Matrix: Water  
Analysis Batch: 257090

Client Sample ID: B35Y88  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	0.86	B	0.810	B	mg/L		6	20

### QC Association Summary

Client: CH2M Hill Plateau Remediation Company  
Project/Site: W16-006

TestAmerica Job ID: 160-17818-1  
SDG: SL2220

#### General Chemistry

#### Analysis Batch: 257090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-17818-1	B35Y88	Total/NA	Water	9060	
160-17818-1 DU	B35Y88	Total/NA	Water	9060	
160-17818-1 MS	B35Y88	Total/NA	Water	9060	
160-17818-2	B35Y89	Total/NA	Water	9060	
160-17818-3	B35Y91	Total/NA	Water	9060	
160-17818-4	B35Y90	Total/NA	Water	9060	
LCS 160-257090/26	Lab Control Sample	Total/NA	Water	9060	
MB 160-257090/25	Method Blank	Total/NA	Water	9060	

