

September 19, 2014

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: 160-8313-1

TestAmerica Sample Delivery Group: SL1585
Client Project/Site: L14-003

For:

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

Attn: General Mailbox



Authorized for release by:
9/19/2014 9:58:46 AM

Jayna Awalt, Project Manager II
(314)298-8566

jayna.awalt@testamericainc.com

LINKS

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results through
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www.testamericainc.com

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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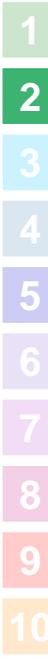


Table of Contents

Cover Page	1
Table of Contents	2
Case Narrative	3
Chain of Custody	6
Definitions/Glossary	11
Method Summary	12
Sample Summary	13
Client Sample Results	14
QC Sample Results	15
QC Association Summary	19

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Job ID: 160-8313-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
MS B3-60
Richland, Washington 99352
September 19, 2014
Attention: Scot Fitzgerald

SDG	: SL1585
Number of Samples	: 1 sample
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: September 10, 2014

II. Introduction

On September 10, 1 sample was received by TestAmerica - St. Louis for chemical analysis. The sample was 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: L14-003

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.

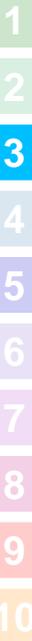
Deviation from Request: **For Metals analyses, per standard practice, all 6020 water and soil samples are initially prepared at a 2x dilution. This standard dilution does not affect reporting limits as MDL studies are also prepared in the same manner. These dilutions do not necessitate flagging unless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

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.



Job ID: 160-8313-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

- **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. Due to limitations of the LIMS system, "D" flags may appear on QC samples.
- **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 organic 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.

Mercury

Batch: 144443

Mercury was detected in method blank MB 160-143810/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "B". If the associated sample reported a result above the MDL and/or RL and is not greater than 5x the method blank, the result has been flagged "C".

Anions

Batch: 143987

Chloride was detected in method blank MB 160-143987/3 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "B". If the associated sample reported a result above the MDL and/or RL and is not greater than 5x the method blank, the result has been flagged "C".

The following samples were diluted to bring the concentration of target analytes within the calibration range: B2XNF5 (160-8313-1). Elevated reporting limits (RLs) are provided. This analyte has been qualified accordingly with a "D" flag in the associated samples.

The matrix spike (MS) recoveries for Nitrite were outside the lower control limit (90%). Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. (160-8313-1 MS), (160-8318-5 MS) This analyte has been qualified accordingly with an "N" flag in the associated samples.

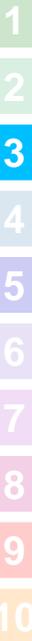
There were no observations or non-conformances associated with the following methods:

ICPMS Metals

ICP Metals

TDS

I certify that this Summary Package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the signature on the cover page has authorized release of the data contained in this hard copy data package.



Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Job ID: 160-8313-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

Reviewed and approved:

Jayna Awalt
St. Louis Project Manager

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Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-8313-1

SDG Number: SL1585

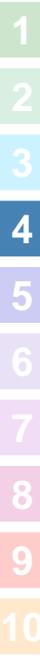
Login Number: 8313

List Number: 1

Creator: Daniels, Brian J

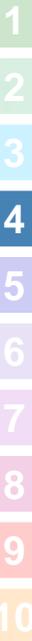
List Source: TestAmerica St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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	2.4
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



CH2MHill		au Remediation Company		CHAIN OF CUSTODY/S E ANALYSIS REQUEST		L14-003-029	PAGE	OF 1			
COLLECTOR	Mike Coarity S1585	COMPANY CONTACT	WATERS-HUSTED, K	TELEPHONE NO.	376-4650	PROJECT COORDINATOR	BOWMAN, MW	PRICE CODE	C05	DATA	TURNAROUND
SAMPLING LOCATION	TEDEF End of Pipe (Bldg 6653)	PROJECT DESIGNATION	200 TEDEF EOP (Bldg 6653) - Monthly & Quarterly Sampling FY2014	SAF NO.	L14-003	COA	300025JDBA	AIR QUALITY	<input type="checkbox"/>	METHOD OF SHIPMENT	GOVERNMENT VEHICLE
ICE CHEST NO.	6005-116	FIELD LOGBOOK NO.	N/A	ACTUAL SAMPLE DEPTH	N/A	COA	300025JDBA				
SHIPPED TO	TestAmerica St. Louis	OFFSITE PROPERTY NO.	N/A			BILL OF LADING/AIR BILL NO.	7710-98110049				
MATRIX* OL = OTHER LIQUID OS = OTHER SOLID S = SOIL W = WATER		SPECIAL HANDLING AND/OR STORAGE		POSSIBLE SAMPLE HAZARDS/ REMARKS		ANALYSIS		HOLDING TIME		PRESERVATION	
B2XNF5	W	9/19/14 0810	1X1L aG	✓	Anions; TDS {TDS}; ✓			28 Days/48 Hours			Cool to 4C
B2XNF5	W	9/19/14 0810	1X500mL P	✓	ICP for TEDEF End of pipe; ✓ICP-MS for TEDEF End of pipe; Mercury by CVAA; ✓			6 months/28 days			HNO3 to pH <2

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	OPS: Deliver TEDEF monthly composite sample to SGRP 5-Bay for shipment to Test America St Louis. For composite sample, record date/time the sampler was turned off on the COC as the sample date/time.	
Mike Coarity	9/19/14 0930	L.D. Wall CHPRC	SEP 09 2014 0930		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	OPS: Was there sufficient volume in the composite sampler to fill all the bottles (circle one)? Y / N	
L.D. Wall CHPRC	SEP 09 2014 1400	FED EX		Y / N	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	TASL: Steam condensate/cooling water sample. Rad levels are expected to be < 10 pCi/L alpha, < 15 pCi/L beta.	
FED EX					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	



September 19, 2014

Fluor Hanford

LEF SAMPLE FIELD RECORD

Page 1 of 1

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

SAMPLING EVENT

Sampling Event: TEDF Monthly If Other, specify sample location: _____

SAMPLING INFORMATION

SAF #	COC #	Sample #(s)	Sample Type
<u>L14-003</u>	<u>L14-003-029</u>	<u>B2XNF5</u>	<u>Composite</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

LERF/ETF SAMPLING

Tank/basin/drum being sampled and plant data:

LERF Basin 42; 43; 44; Level _____ ft SWRT Tank A; B; Level _____ %
 Surge Tank Level _____ % Concentrate Tank A; B; Level _____ %
 Verification Tank A; B; C; Level _____ % Powder Drum Number _____

ETF operations impacting sampling (specify):

Data completed by (print): _____ Date: _____

TEDF SAMPLING

Sampler Type: Sigma Streamline

Containers placed by (print) Mike Capity Sampler Start Date/Time 9-9-14 0800 ICS setting 36

Containers removed by (print) _____ Sampler End Date/Time _____

TEDF plant data at time of sampling: pH 8.07 Conductivity 138 uS/cm

TEDF operations impacting sampling (specify):

Was there sufficient volume in the composite sampler to fill all the sample bottles on the COC? Yes No

Data completed by (print): _____ Date: _____

ADDITIONAL SAMPLING/PLANT INFORMATION

Provide any additional information concerning sampling and sample handling:

if samples were stored in refrigerator, the temperature reading is _____

Additional information completed by (print): _____ Date: _____

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GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number L14-003-029 CACN/COA 300025/CA40 Customer Identification Number SAF#: L14-003

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
Effluent from 200 Area TEDF.

MSDS Available? No Yes Hanford MSDS No. _____

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?

By checking "unknown" the customer understands that no knowledge is available following a careful search.

List Federal Waste Code(s): _____

List Constituent(s): _____

P Codes: _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No
U Codes: _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No
K Codes: _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown
F Codes: _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No <input type="radio"/> Unknown

b) List applicable characteristic waste codes, flash point, pH, constituents, and concentrations as appropriate.

D001: <input type="checkbox"/> FP <100°F <input type="checkbox"/> FP ≥100 <140°F <input type="checkbox"/> DOT Oxidizer	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
D002: <input type="checkbox"/> pH ≤2 <input type="checkbox"/> pH ≥12.5 <input type="checkbox"/> Solid Corrosive (WSC2)	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
D003: <input type="checkbox"/> Cyanide <input type="checkbox"/> Sulfide <input type="checkbox"/> Water Reactive <input type="checkbox"/> Other _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown
D004-D043 (Identify applicable waste codes and concentrations): _____ <small>(i.e., peroxide former, explosive, air reactive)</small>	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> Unknown

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):

NA

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):

NA

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

(*State mixture rule for ignitability)

WT01: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP01: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
WT02: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP02: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
W001: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown	WP03: <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown
List constituents and concentrations: _____	F003:* <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Unknown

4. Is this material TSCA regulated for PCBs? Yes No Unknown Analysis Requested

List concentration if applicable: _____

If yes, what is the source of the PCBs? (see TSCA PCB Hanford Site User Guide, DOE/RL-2001-50)

<input type="checkbox"/> PCB Liquid Waste	<input type="checkbox"/> PCB Bulk Product Waste	<input type="checkbox"/> PCB Transformer ≥500 ppm	<input type="checkbox"/> Unknown
<input type="checkbox"/> PCB Remediation Waste	<input type="checkbox"/> PCB R&D Waste	<input type="checkbox"/> PCB contaminated electrical equipment (capacitor/ballast) <500 ppm	
<input type="checkbox"/> PCB Spill Material	<input type="checkbox"/> PCB Item	<input type="checkbox"/> Other PCB Waste (list) _____	

5. Is this material TRU? Yes No Unknown

6. ACCURACY OF INFORMATION

Based on my inquiry of those individuals immediately responsible for obtaining this information, that to the best of my knowledge, the information entered in this document is true, accurate, and complete.

Print & Sign Mark Bowman Mark Bowman Date 8-7-14

FedEx[®] Tracking**771098110049**Ship (P/U) date :
Tues 9/09/2014 3:51 pm

RICHLAND, WA US

Actual delivery :
Wed 9/10/2014 9:06 am

EARTH CITY, MO US

Delivered

Signed for by: B.DANIELS

Let us tell you when your shipment arrives. Sign up for delivery notifications

Travel History

Date/Time	Activity	Location
- 9/10/2014 - Wednesday		
9:06 am	Delivered	EARTH CITY, MO
7:00 am	On FedEx vehicle for delivery	EARTH CITY, MO
6:55 am	At local FedEx facility	EARTH CITY, MO
5:13 am	At destination sort facility	BERKELEY, MO
4:27 am	Departed FedEx location	MEMPHIS, TN
1:31 am	Arrived at FedEx location	MEMPHIS, TN
- 9/09/2014 - Tuesday		
5:12 pm	Left FedEx origin facility	PASCO, WA
3:56 pm	Shipment information sent to FedEx	
3:51 pm	Picked up	PASCO, WA

Shipment Facts

Tracking number	771098110049	Service	FedEx Priority Overnight
Weight	81 lbs / 36.74 kgs	Dimensions	29x16x16 in.
Delivered To	Shipping/Receiving	Total pieces	1
Total shipment weight	81 lbs / 36.74 kgs	Shipper reference	gws-116
Packaging	Your Packaging	Special handling section	Deliver Weekday

Qualifiers

Metals

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

General Chemistry

Qualifier	Qualifier Description
U	Analyzed for but not detected.
N	MS, MSD: Spike recovery exceeds upper or lower control limits.
D	The reported value is from a dilution.
B	Estimated result. Result is less than the RL, but greater than MDL

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)

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL SL
245.1	Mercury (CVAA)	EPA	TAL SL
6010C	Metals (ICP)	SW846	TAL SL
160.1	Solids, Total Dissolved (TDS)	MCAWW	TAL SL
300.0	Anions, Ion Chromatography	MCAWW	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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



September 19, 2014
Sample Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-8313-1	B2XNF5	Water	09/09/14 08:10	09/10/14 09:15

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Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method: 200.8 - Metals (ICP/MS)

Client Sample ID: B2XNF5
Date Collected: 09/09/14 08:10
Date Received: 09/10/14 09:15

Lab Sample ID: 160-8313-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2	U	4.0	1.2	ug/L		09/15/14 13:20	09/17/14 21:05	2
Cadmium	0.10	U	1.0	0.10	ug/L		09/15/14 13:20	09/17/14 21:05	2
Chromium	1.0	U	6.5	1.0	ug/L		09/15/14 13:20	09/17/14 21:05	2
Lead	0.19	B	1.0	0.17	ug/L		09/15/14 13:20	09/17/14 21:05	2
Manganese	3.7		2.0	0.25	ug/L		09/15/14 13:20	09/17/14 21:05	2

Method: 245.1 - Mercury (CVAA)

Client Sample ID: B2XNF5
Date Collected: 09/09/14 08:10
Date Received: 09/10/14 09:15

Lab Sample ID: 160-8313-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.050	U	0.20	0.050	ug/L		09/12/14 14:40	09/16/14 13:30	1

Method: 6010C - Metals (ICP)

Client Sample ID: B2XNF5
Date Collected: 09/09/14 08:10
Date Received: 09/10/14 09:15

Lab Sample ID: 160-8313-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	20.8	B	100	12.8	ug/L		09/15/14 13:18	09/16/14 15:50	1

General Chemistry

Client Sample ID: B2XNF5
Date Collected: 09/09/14 08:10
Date Received: 09/10/14 09:15

Lab Sample ID: 160-8313-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	100		5.0	3.5	mg/L			09/16/14 16:05	1
Nitrate as N	0.054		0.020	0.0040	mg/L			09/10/14 14:14	1
Nitrite as N	0.0030	U N	0.020	0.0030	mg/L			09/10/14 14:14	1
Fluoride	0.10		0.10	0.010	mg/L			09/10/14 14:14	1
Bromide	0.025	U	0.25	0.025	mg/L			09/10/14 14:14	1
Sulfate	8.9		0.50	0.050	mg/L			09/10/14 14:14	1
Phosphate	0.078	U	0.50	0.078	mg/L			09/10/14 14:14	1

General Chemistry - DL

Client Sample ID: B2XNF5
Date Collected: 09/09/14 08:10
Date Received: 09/10/14 09:15

Lab Sample ID: 160-8313-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.2	D	4.0	0.40	mg/L			09/10/14 14:29	20

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 160-143957/1-A
Matrix: Water
Analysis Batch: 144686

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 143957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2	U	4.0	1.2	ug/L		09/15/14 13:20	09/17/14 20:52	2
Cadmium	0.10	U	1.0	0.10	ug/L		09/15/14 13:20	09/17/14 20:52	2
Chromium	1.0	U	6.5	1.0	ug/L		09/15/14 13:20	09/17/14 20:52	2
Lead	0.17	U	1.0	0.17	ug/L		09/15/14 13:20	09/17/14 20:52	2
Manganese	0.25	U	2.0	0.25	ug/L		09/15/14 13:20	09/17/14 20:52	2

Lab Sample ID: LCS 160-143957/2-A
Matrix: Water
Analysis Batch: 144686

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 143957

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1000	965.9		ug/L		97	85 - 115
Cadmium	1000	963.6		ug/L		96	85 - 115
Chromium	1000	990.9		ug/L		99	85 - 115
Lead	1000	992.4		ug/L		99	85 - 115
Manganese	1000	980.9		ug/L		98	85 - 115

Lab Sample ID: 160-8313-1 MS
Matrix: Water
Analysis Batch: 144686

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143957

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.2	U	1000	958.5		ug/L		96	70 - 130
Cadmium	0.10	U	1000	974.5		ug/L		97	70 - 130
Chromium	1.0	U	1000	982.9		ug/L		98	70 - 130
Lead	0.19	B	1000	996.6		ug/L		100	70 - 130
Manganese	3.7		1000	964.0		ug/L		96	70 - 130

Lab Sample ID: 160-8313-1 MSD
Matrix: Water
Analysis Batch: 144686

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143957

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	1.2	U	1000	980.4		ug/L		98	70 - 130	2	20
Cadmium	0.10	U	1000	974.2		ug/L		97	70 - 130	0	20
Chromium	1.0	U	1000	979.1		ug/L		98	70 - 130	0	20
Lead	0.19	B	1000	989.2		ug/L		99	70 - 130	1	20
Manganese	3.7		1000	982.8		ug/L		98	70 - 130	2	20

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 160-143810/1-A
Matrix: Water
Analysis Batch: 144443

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 143810

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.182	B	0.20	0.050	ug/L		09/12/14 14:40	09/16/14 13:23	1

TestAmerica St. Louis

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method: 245.1 - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 160-143810/2-A
Matrix: Water
Analysis Batch: 144443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 143810

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.55		ug/L		111	85 - 115

Lab Sample ID: 160-8313-1 MS
Matrix: Water
Analysis Batch: 144443

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143810

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.050	U	5.00	4.87		ug/L		97	70 - 130

Lab Sample ID: 160-8313-1 MSD
Matrix: Water
Analysis Batch: 144443

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143810

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.050	U	5.00	4.75		ug/L		95	70 - 130	3	20

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-143956/1-A
Matrix: Water
Analysis Batch: 144311

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 143956

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	12.8	U	100	12.8	ug/L		09/15/14 13:18	09/16/14 15:43	1

Lab Sample ID: LCS 160-143956/2-A
Matrix: Water
Analysis Batch: 144311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 143956

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	10000	9739		ug/L		97	80 - 120

Lab Sample ID: 160-8313-1 MS
Matrix: Water
Analysis Batch: 144311

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143956

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	20.8	B	10000	9720		ug/L		97	75 - 125

Lab Sample ID: 160-8313-1 MSD
Matrix: Water
Analysis Batch: 144311

Client Sample ID: B2XNF5
Prep Type: Total/NA
Prep Batch: 143956

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Iron	20.8	B	10000	9898		ug/L		99	75 - 125	2	20

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method: 160.1 - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 160-144307/1
Matrix: Water
Analysis Batch: 144307

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	3.5	U	5.0	3.5	mg/L			09/16/14 16:05	1

Lab Sample ID: LCS 160-144307/2
Matrix: Water
Analysis Batch: 144307

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	507.0		mg/L		101	90 - 110

Lab Sample ID: 160-8313-1 DU
Matrix: Water
Analysis Batch: 144307

Client Sample ID: B2XNF5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	100		114.0		mg/L		13	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 160-143987/3
Matrix: Water
Analysis Batch: 143987

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.0040	U	0.020	0.0040	mg/L			09/10/14 13:44	1
Nitrite as N	0.0030	U	0.020	0.0030	mg/L			09/10/14 13:44	1
Fluoride	0.010	U	0.10	0.010	mg/L			09/10/14 13:44	1
Chloride	0.0209	B	0.20	0.020	mg/L			09/10/14 13:44	1
Bromide	0.025	U	0.25	0.025	mg/L			09/10/14 13:44	1
Sulfate	0.050	U	0.50	0.050	mg/L			09/10/14 13:44	1
Phosphate	0.078	U	0.50	0.078	mg/L			09/10/14 13:44	1

Lab Sample ID: LCS 160-143987/4
Matrix: Water
Analysis Batch: 143987

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.400	0.394		mg/L		98	90 - 110
Nitrite as N	0.160	0.153		mg/L		96	90 - 110
Fluoride	1.00	0.971		mg/L		97	90 - 110
Chloride	2.00	1.92		mg/L		96	90 - 110
Bromide	2.00	1.96		mg/L		98	90 - 110
Sulfate	8.00	7.49		mg/L		94	90 - 110
Phosphate	8.00	7.67		mg/L		96	90 - 110

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 160-8313-1 MS
Matrix: Water
Analysis Batch: 143987

Client Sample ID: B2XNF5
Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Nitrate as N	0.054		0.400	0.440		mg/L		96	90 - 110	
Nitrite as N	0.0030	U N	0.100	0.0685	N	mg/L		69	90 - 110	
Fluoride	0.10		2.00	2.07		mg/L		98	90 - 110	
Bromide	0.025	U	2.00	1.96		mg/L		98	90 - 110	
Sulfate	8.9		4.00	12.89		mg/L		99	90 - 110	
Phosphate	0.078	U	4.00	3.82		mg/L		95	90 - 110	

Lab Sample ID: 160-8313-1 DU
Matrix: Water
Analysis Batch: 143987

Client Sample ID: B2XNF5
Prep Type: Total/NA

Analyte	Sample	Sample	DU		Unit	D	RPD	RPD	
	Result	Qualifier	Result	Qualifier				RPD	Limit
Nitrate as N	0.054		0.0524		mg/L		3	20	
Nitrite as N	0.0030	U N	0.0030	U	mg/L		NC	20	
Fluoride	0.10		0.103		mg/L		0.5	20	
Bromide	0.025	U	0.025	U	mg/L		NC	20	
Sulfate	8.9		8.99		mg/L		0.6	20	
Phosphate	0.078	U	0.078	U	mg/L		NC	20	

Method: 300.0 - Anions, Ion Chromatography - DL

Lab Sample ID: 160-8313-1 MS
Matrix: Water
Analysis Batch: 143987

Client Sample ID: B2XNF5
Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Chloride - DL	8.2	D	40.0	47.57	D	mg/L		99	90 - 110	

Lab Sample ID: 160-8318-A-5 MS ^2
Matrix: Water
Analysis Batch: 143987

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	Limits
Nitrite as N - DL	0.022	B D N	0.200	0.172	D N	mg/L		75	90 - 110	
Fluoride - DL	0.37	D	4.00	4.53	D	mg/L		104	90 - 110	
Bromide - DL	0.063	B D	4.00	4.03	D	mg/L		99	90 - 110	
Phosphate - DL	1.6	D	8.00	9.83	D	mg/L		103	90 - 110	

Lab Sample ID: 160-8313-1 DU
Matrix: Water
Analysis Batch: 143987

Client Sample ID: B2XNF5
Prep Type: Total/NA

Analyte	Sample	Sample	DU		Unit	D	RPD	RPD	
	Result	Qualifier	Result	Qualifier				RPD	Limit
Chloride - DL	8.2	D	8.36	D	mg/L		2	20	

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

Metals

Prep Batch: 143810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	245.1	
160-8313-1 MS	B2XNF5	Total/NA	Water	245.1	
160-8313-1 MSD	B2XNF5	Total/NA	Water	245.1	
LCS 160-143810/2-A	Lab Control Sample	Total/NA	Water	245.1	
MB 160-143810/1-A	Method Blank	Total/NA	Water	245.1	

Prep Batch: 143956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	3010A	
160-8313-1 MS	B2XNF5	Total/NA	Water	3010A	
160-8313-1 MSD	B2XNF5	Total/NA	Water	3010A	
LCS 160-143956/2-A	Lab Control Sample	Total/NA	Water	3010A	
MB 160-143956/1-A	Method Blank	Total/NA	Water	3010A	

Prep Batch: 143957

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	200.7/200.8	
160-8313-1 MS	B2XNF5	Total/NA	Water	200.7/200.8	
160-8313-1 MSD	B2XNF5	Total/NA	Water	200.7/200.8	
LCS 160-143957/2-A	Lab Control Sample	Total/NA	Water	200.7/200.8	
MB 160-143957/1-A	Method Blank	Total/NA	Water	200.7/200.8	

Analysis Batch: 144311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	6010C	143956
160-8313-1 MS	B2XNF5	Total/NA	Water	6010C	143956
160-8313-1 MSD	B2XNF5	Total/NA	Water	6010C	143956
LCS 160-143956/2-A	Lab Control Sample	Total/NA	Water	6010C	143956
MB 160-143956/1-A	Method Blank	Total/NA	Water	6010C	143956

Analysis Batch: 144443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	245.1	143810
160-8313-1 MS	B2XNF5	Total/NA	Water	245.1	143810
160-8313-1 MSD	B2XNF5	Total/NA	Water	245.1	143810
LCS 160-143810/2-A	Lab Control Sample	Total/NA	Water	245.1	143810
MB 160-143810/1-A	Method Blank	Total/NA	Water	245.1	143810

Analysis Batch: 144686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	200.8	143957
160-8313-1 MS	B2XNF5	Total/NA	Water	200.8	143957
160-8313-1 MSD	B2XNF5	Total/NA	Water	200.8	143957
LCS 160-143957/2-A	Lab Control Sample	Total/NA	Water	200.8	143957
MB 160-143957/1-A	Method Blank	Total/NA	Water	200.8	143957

September 19, 2014
QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: L14-003

TestAmerica Job ID: 160-8313-1
SDG: SL1585

General Chemistry

Analysis Batch: 143987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	300.0	
160-8313-1 - DL	B2XNF5	Total/NA	Water	300.0	
160-8313-1 DU	B2XNF5	Total/NA	Water	300.0	
160-8313-1 DU - DL	B2XNF5	Total/NA	Water	300.0	
160-8313-1 MS	B2XNF5	Total/NA	Water	300.0	
160-8313-1 MS - DL	B2XNF5	Total/NA	Water	300.0	
160-8318-A-5 MS ^2 - DL	Matrix Spike	Total/NA	Water	300.0	
LCS 160-143987/4	Lab Control Sample	Total/NA	Water	300.0	
MB 160-143987/3	Method Blank	Total/NA	Water	300.0	

Analysis Batch: 144307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-8313-1	B2XNF5	Total/NA	Water	160.1	
160-8313-1 DU	B2XNF5	Total/NA	Water	160.1	
LCS 160-144307/2	Lab Control Sample	Total/NA	Water	160.1	
MB 160-144307/1	Method Blank	Total/NA	Water	160.1	