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: 160-22870-1
TestAmerica Sample Delivery Group: SL2557
Client Project/Site: F12-023

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

Attn: Mr. Scot Fitzgerald

Authorized for release by:
7/17/2017 2:11:10 PM

Jayna Awalt, Project Manager II
(314)298-8566
jayna.awalt@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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Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Job ID: 160-22870-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
July 17, 2017
Attention: Scot Fitzgerald

SDG	: SL2557
Number of Samples	: 3 samples
Sample Matrix	: Water
Data Deliverable	: Summary
Date SDG Closed	: June 15, 2017

II. Introduction

On June 15, 3 samples were received by TestAmerica - St. Louis for 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: F12-023

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 a narrative note; however, they are flagged “D” due to a limitation in the LIMS.

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, 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.

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.

Job ID: 160-22870-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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.
- **B** - For radiochemistry, Method Blank reported above the MDC. Sample activity is > 5% the method blank.
- **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/RL but not greater than 5% the MB.
- **D** - For all analyses, the sample result was obtained from the analysis of a dilution. For ICPMS Metals analyses, per standard practice, all 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 and will not be narrated below. Only dilutions above 2x will be narrated and considered a true dilution for these samples.
- **N** - For inorganics, rad 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.
- **P -** For organic analyses (PCB/Pests only), the aroclor target analyte has greater than 25% difference for detected concentrations between the two GC columns.
- **X-** Organics and Anions IC - Sample concentration over calibration and/or surrogate recovery outside QC limits.
- **X-** Inorganics - The analyte present in the original sample is > 4x the spike concentration.
- **X-** Radiochemistry - Carrier or Tracer recovery is outside limits.
- **Z-** Sample was prepped or analyzed beyond the specified sample holding time.
- **y -** RPD is outside established limits.

ICPMS Metals

Batch: 317281

The method blank for preparation batch preparation batch 160-316572 and analytical batch 160-317281 contained Iron above the reporting limit (RL). None of the samples associated with this method blank contained the target compound; therefore, re-extraction and/or re-analysis of samples were not performed. (MB 160-316572/1-A)

Copper was detected in method blank MB 160-316572/1-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 5% the method blank, the result has been flagged "C".

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

ICP Metals
Mercury

Job ID: 160-22870-1 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

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: 160-22870-1
SDG Number: SL2557

Login Number: 22870
List Number: 1
Creator: Daniels, Brian J

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	0.5
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	

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F12-023-318	PAGE 1 OF 1
COLLECTOR CHRIS FULTON CHPRC SL2557	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7H	DATA TURNAROUND
SAMPLING LOCATION 100-DX, Bldg 1804D, Influent Tank, valve T-M3 (V-ME006A)	PROJECT DESIGNATION 100-DX Pump and Treat - INFLUENT/EFFLUENT/TRANSFER TANKS - WAT		SAF NO. F12-023	AIR QUALITY ☐	30 Days / 30 Days
ICE CHEST NO. GWS-1608	FIELD LOGBOOK NO. HNF-N-491-16	ACTUAL SAMPLE DEPTH N/A	COA 302841	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 779401309407		

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

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 HANDLING AND/OR STORAGE
NA

PRESERVATION	HNO3 to pH <2
HOLDING TIME	28 Days
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3B306	WATER	JUN 13 2017	1205	✓

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July 17, 2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON CHPRC	DATE/TIME: JUN 13 2017 1345	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: JUN 13 2017 1345
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: JUN 14 2017 0700	RECEIVED BY/STORED IN: Janelle Zunker CHPRC	DATE/TIME: JUN 14 2017 0700
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC	DATE/TIME: JUN 14 2017 1100	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FEDEX	DATE/TIME:	RECEIVED BY/STORED IN: Tom Davis	DATE/TIME: 6/15/17 1100
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:

SPECIAL INSTRUCTIONS
TRVL-17-134; ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** The extraction wells associated with this SAF are all located at the Transfer Building.
(1) 7470_MERCURY_CV: COMMON (AQUEOUS);✓ 6020_METALS_ICPMS; COMMON {Antimony,✓ Barium,✓ Cadmium,✓ Chromium,✓ Copper,✓ Lead,✓ Selenium✓}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic,✓ Iron,✓ Manganese,✓ Nickel,✓ Uranium,✓ Zinc✓}; 6010_METALS_ICP: COMMON (Add-on) {Bismuth};✓

LABORATORY SECTION	RECEIVED BY		TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD		DISPOSED BY	DATE/TIME

PRINTED ON 5/8/2017 | FSR ID = FSR45061 | TRVL NUM = TRVL-17-134 | A-6003-618 (REV 2)

10/20/2017

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F12-023-322	PAGE 1 OF 1
COLLECTOR CHRIS FULTON CHPRC SL2557	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7H	DATA TURNAROUND
SAMPLING LOCATION 100-DX, Bldg 1804D, Effluent Tank, valve T-M5 (V-MJ030A) FT	PROJECT DESIGNATION 100-DX Pump and Treat - INFLUENT/EFFLUENT/TRANSFER TANKS - WAT		SAF NO. F12-023	AIR QUALITY ☐	30 Days / 30 Days
ICE CHEST NO. GWS-608	FIELD LOGBOOK NO. HNF-N- 491-16/36	ACTUAL SAMPLE DEPTH N/A	COA 302841	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 779401309407		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	HNO3 to pH <2
A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*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.	HOLDING TIME	28 Days
		TYPE OF CONTAINER	G/P
		NO. OF CONTAINER(S)	1
		VOLUME	500mL
	SPECIAL HANDLING AND/OR STORAGE NA	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3B310	WATER	JUN 13 2017	0740	✓

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON CHPRC — DATE/TIME: JUN 13 2017 1345	RECEIVED BY/STORED IN: SSU-1 — DATE/TIME: JUN 13 2017 1345	TRVL-17-134; ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** The extraction wells associated with this SAF are all located at the Transfer Building. (1) 7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: COMMON {Antimony, Barium, Cadmium, Chromium, Copper, Lead, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Iron, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON (Add-on) {Bismuth};
RELINQUISHED BY/REMOVED FROM: SSU-1 — DATE/TIME: JUN 14 2017 0700	RECEIVED BY/STORED IN: Janelle Zunker CHPRC — DATE/TIME: JUN 14 2017 0700	
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC — DATE/TIME: JUN 14 2017 1400	RECEIVED BY/STORED IN: FEDEX — DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: — DATE/TIME: FED EX	RECEIVED BY/STORED IN: — DATE/TIME: 6/15/17 1000	
RELINQUISHED BY/REMOVED FROM: — DATE/TIME:	RECEIVED BY/STORED IN: — DATE/TIME:	
RELINQUISHED BY/REMOVED FROM: — DATE/TIME:	RECEIVED BY/STORED IN: — DATE/TIME:	
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

PRINTED ON 5/8/2017 | FSR ID = FSR45062 | TRVL NUM = TRVL-17-134 | A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F12-023-325	PAGE 1 OF 1
COLLECTOR CHRIS FULTON CHPRC SL2557	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR SUMNER, LC	PRICE CODE 7H / AIR QUALITY ☐ / DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION 100-DX, Bldg 1804D, Effluent Tank, valve T-M5 (V-MJ030A)	PROJECT DESIGNATION 100-DX Pump and Treat - INFLUENT/EFFLUENT/TRANSFER TANKS - WAT		SAF NO. F12-023	
ICE CHEST NO. GWS-608	FIELD LOGBOOK NO. HNF-N- 491-16	ACTUAL SAMPLE DEPTH N/A	COA 302841	METHOD OF SHIPMENT FEDERAL EXPRESS / ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 779401309407	

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

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 HANDLING AND/OR STORAGE
NA

PRESERVATION	HNO3 to pH <2
HOLDING TIME	28 Days
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3B313	WATER	JUN 13 2017	1150	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON	DATE/TIME: JUN 13 2017 1345	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: JUN 13 2017 1345
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: JUN 14 2017 0700	RECEIVED BY/STORED IN: Janelle Zunker CHPRC	DATE/TIME: JUN 14 2017 0700
RELINQUISHED BY/REMOVED FROM: Janelle Zunker CHPRC	DATE/TIME: JUN 14 2017 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME: FED EX	RECEIVED BY/STORED IN: Jayna Awalt Jayna Awalt for BD	DATE/TIME: 6/15/17 1020
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:

SPECIAL INSTRUCTIONS
TRVL-17-134; ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** The extraction wells associated with this SAF are all located at the Transfer Building. (1) 7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: COMMON {Antimony, Barium, Cadmium, Chromium, Copper, Lead, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Iron, Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON (Add-on) {Bismuth};

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 5/8/2017 | FSR ID = FSR45063 | TRVL NUM = TRVL-17-134 | A-6003-618 (REV 2)

FedEx ® Tracking

779401309407

Ship date:		Actual delivery:
Wed 6/14/2017		**Thu 6/15/2017 9:52 am**
RICHLAND, WA US	**Delivered** *Signed for by: B.DANIELS*	EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
- 6/15/2017 - Thursday		
9:52 am	Delivered	EARTH CITY, MO
7:55 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:50 am	At local FedEx facility	EARTH CITY, MO
5:25 am	At destination sort facility	BERKELEY, MO
4:18 am	Departed FedEx location	MEMPHIS, TN
12:15 am	Arrived at FedEx location	MEMPHIS, TN
- 6/14/2017 - Wednesday		
4:51 pm	Left FedEx origin facility	PASCO, WA
3:15 pm	Picked up	PASCO, WA
1:17 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking number	779401309407	**Service**	FedEx Standard Overnight
Weight	73 lbs / 33.11 kgs	**Dimensions**	28x16x16 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	73 lbs / 33.11 kgs	**Terms**	Recipient
Shipper reference	GWS-608	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge	**Standard transit**	6/15/2017 by 3:00 pm

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Qualifiers

Metals

Qualifier	Qualifier Description
D	The reported value is from a dilution.
U	Analyzed for but not detected.
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.
¤	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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL SL
6020A	Metals (ICP/MS)	SW846	TAL SL
7470A	Mercury (CVAA)	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: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-22870-1	B3B306	Water	06/13/17 12:05	06/15/17 10:00
160-22870-2	B3B310	Water	06/13/17 07:40	06/15/17 10:00
160-22870-3	B3B313	Water	06/13/17 11:50	06/15/17 10:00

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method: 6010C - Metals (ICP)

Client Sample ID: B3B306
Date Collected: 06/13/17 12:05
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bismuth	50.0	U	200	50.0	ug/L		07/07/17 10:16	07/10/17 19:44	1

Client Sample ID: B3B310
Date Collected: 06/13/17 07:40
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bismuth	50.0	U	200	50.0	ug/L		07/07/17 10:16	07/10/17 19:48	1

Client Sample ID: B3B313
Date Collected: 06/13/17 11:50
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bismuth	50.0	U	200	50.0	ug/L		07/07/17 10:16	07/10/17 19:53	1

Method: 6020A - Metals (ICP/MS)

Client Sample ID: B3B306
Date Collected: 06/13/17 12:05
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Arsenic	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Barium	**67.5**	**D**	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:25	2
Cadmium	0.20	U D	0.50	0.20	ug/L		07/07/17 10:18	07/13/17 10:25	2
Chromium	**16.6**	**D**	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Copper	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:25	2
Iron	20.0	U D	50.0	20.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Lead	1.0	U D	3.0	1.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Manganese	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:25	2
Nickel	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Selenium	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:25	2
Uranium	**1.8**	**D**	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:25	2
Zinc	7.5	U D	20.0	7.5	ug/L		07/07/17 10:18	07/13/17 10:25	2

Client Sample ID: B3B310
Date Collected: 06/13/17 07:40
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Arsenic	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Barium	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:32	2
Cadmium	0.20	U D	0.50	0.20	ug/L		07/07/17 10:18	07/13/17 10:32	2
Chromium	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Copper	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:32	2
Iron	20.0	U D	50.0	20.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Lead	1.0	U D	3.0	1.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Manganese	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:32	2
Nickel	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Selenium	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:32	2
Uranium	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:32	2

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method: 6020A - Metals (ICP/MS) (Continued)

Client Sample ID: B3B310
Date Collected: 06/13/17 07:40
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	7.5	U D	20.0	7.5	ug/L		07/07/17 10:18	07/13/17 10:32	2

Client Sample ID: B3B313
Date Collected: 06/13/17 11:50
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Arsenic	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Barium	**69.1**	**D**	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:39	2
Cadmium	0.20	U D	0.50	0.20	ug/L		07/07/17 10:18	07/13/17 10:39	2
Chromium	**4.1**	**B D**	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Copper	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:39	2
Iron	20.0	U D	50.0	20.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Lead	1.0	U D	3.0	1.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Manganese	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 10:39	2
Nickel	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Selenium	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 10:39	2
Uranium	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 10:39	2
Zinc	7.5	U D	20.0	7.5	ug/L		07/07/17 10:18	07/13/17 10:39	2

Method: 7470A - Mercury (CVAA)

Client Sample ID: B3B306
Date Collected: 06/13/17 12:05
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L		06/20/17 07:36	06/20/17 14:36	1

Client Sample ID: B3B310
Date Collected: 06/13/17 07:40
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L		06/20/17 07:36	06/20/17 14:38	1

Client Sample ID: B3B313
Date Collected: 06/13/17 11:50
Date Received: 06/15/17 10:00

Lab Sample ID: 160-22870-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L		06/20/17 07:36	06/20/17 14:39	1

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-316569/1-A
Matrix: Water
Analysis Batch: 316808

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 316569

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bismuth	50.0	U	200	50.0	ug/L		07/07/17 10:16	07/10/17 18:16	1

Lab Sample ID: LCS 160-316569/2-A
Matrix: Water
Analysis Batch: 316808

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 316569

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bismuth	1000	1026		ug/L		103	80 - 120

Lab Sample ID: 160-22866-A-1-B MS
Matrix: Water
Analysis Batch: 316808

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 316569

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Bismuth	50.0	U	1000	1036		ug/L		104	75 - 125

Lab Sample ID: 160-22866-A-1-C MSD
Matrix: Water
Analysis Batch: 316808

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 316569

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bismuth	50.0	U	1000	1035		ug/L		104	75 - 125	0	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 160-316572/1-A
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 316572

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Arsenic	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Barium	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 09:18	2
Cadmium	0.20	U D	0.50	0.20	ug/L		07/07/17 10:18	07/13/17 09:18	2
Chromium	4.0	U D	10.0	4.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Copper	0.462	B D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 09:18	2
Iron	57.19	D	50.0	20.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Lead	1.0	U D	3.0	1.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Manganese	0.90	U D	2.0	0.90	ug/L		07/07/17 10:18	07/13/17 09:18	2
Nickel	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Selenium	2.0	U D	5.0	2.0	ug/L		07/07/17 10:18	07/13/17 09:18	2
Uranium	0.40	U D	1.0	0.40	ug/L		07/07/17 10:18	07/13/17 09:18	2
Zinc	7.5	U D	20.0	7.5	ug/L		07/07/17 10:18	07/13/17 09:18	2

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 160-316572/2-A
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 316572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	500	502.0	D	ug/L		100	80 - 120
Arsenic	1000	1028	D	ug/L		103	80 - 120
Barium	1000	980.6	D	ug/L		98	80 - 120
Cadmium	1000	980.0	D	ug/L		98	80 - 120
Chromium	1000	964.2	D	ug/L		96	80 - 120
Copper	1000	974.7	D	ug/L		97	80 - 120
Iron	10000	9817	D	ug/L		98	80 - 120
Lead	1000	971.9	D	ug/L		97	80 - 120
Manganese	1000	985.9	D	ug/L		99	80 - 120
Nickel	1000	1006	D	ug/L		101	80 - 120
Selenium	500	501.5	D	ug/L		100	80 - 120
Uranium	1000	1009	D	ug/L		101	80 - 120
Zinc	1000	984.3	D	ug/L		98	80 - 120

Lab Sample ID: 160-22866-A-1-E MS
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 316572

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	2.0	U D	500	507.5	D	ug/L		101	75 - 125
Arsenic	4.0	B D	1000	1038	D	ug/L		104	75 - 125
Barium	31.2	D	1000	1017	D	ug/L		99	75 - 125
Cadmium	0.20	U D	1000	984.3	D	ug/L		98	75 - 125
Chromium	119	D	1000	1075	D	ug/L		96	75 - 125
Copper	0.42	B D C	1000	959.5	D	ug/L		96	75 - 125
Iron	20.0	U D	10000	9851	D	ug/L		99	75 - 125
Lead	1.0	U D	1000	982.3	D	ug/L		98	75 - 125
Manganese	0.90	U D	1000	990.1	D	ug/L		99	75 - 125
Nickel	2.0	U D	1000	979.5	D	ug/L		98	75 - 125
Selenium	4.6	B D	500	506.2	D	ug/L		100	75 - 125
Uranium	4.0	D	1000	1023	D	ug/L		102	75 - 125
Zinc	7.5	U D	1000	980.9	D	ug/L		98	75 - 125

Lab Sample ID: 160-22866-A-1-F MSD
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 316572

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	2.0	U D	500	515.1	D	ug/L		103	75 - 125	1	20
Arsenic	4.0	B D	1000	1045	D	ug/L		104	75 - 125	1	20
Barium	31.2	D	1000	1029	D	ug/L		100	75 - 125	1	20
Cadmium	0.20	U D	1000	994.4	D	ug/L		99	75 - 125	1	20
Chromium	119	D	1000	1095	D	ug/L		98	75 - 125	2	20
Copper	0.42	B D C	1000	964.7	D	ug/L		96	75 - 125	1	20
Iron	20.0	U D	10000	9884	D	ug/L		99	75 - 125	0	20
Lead	1.0	U D	1000	998.9	D	ug/L		100	75 - 125	2	20
Manganese	0.90	U D	1000	994.8	D	ug/L		99	75 - 125	0	20
Nickel	2.0	U D	1000	989.3	D	ug/L		99	75 - 125	1	20

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 160-22866-A-1-F MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 317281 — **Prep Batch: 316572**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Selenium	4.6	B D	500	520.9	D	ug/L		103	75 - 125	3	20
Uranium	4.0	D	1000	1049	D	ug/L		105	75 - 125	3	20
Zinc	7.5	U D	1000	997.6	D	ug/L		100	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 160-314184/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314369 — **Prep Batch: 314184**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.060	U	0.20	0.060	ug/L		06/20/17 07:36	06/20/17 14:16	1

Lab Sample ID: LCS 160-314184/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314369 — **Prep Batch: 314184**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.15		ug/L		103	80 - 120

Lab Sample ID: 160-22867-A-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314369 — **Prep Batch: 314184**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.060	U	5.00	5.14		ug/L		103	80 - 120

Lab Sample ID: 160-22867-A-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 314369 — **Prep Batch: 314184**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.060	U	5.00	5.17		ug/L		103	80 - 120	0	20

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Metals

Prep Batch: 314184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	7470A	
160-22870-2	B3B310	Total/NA	Water	7470A	
160-22870-3	B3B313	Total/NA	Water	7470A	
MB 160-314184/1-A	Method Blank	Total/NA	Water	7470A	
LCS 160-314184/2-A	Lab Control Sample	Total/NA	Water	7470A	
160-22867-A-1-B MS	Matrix Spike	Total/NA	Water	7470A	
160-22867-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	

Analysis Batch: 314369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	7470A	314184
160-22870-2	B3B310	Total/NA	Water	7470A	314184
160-22870-3	B3B313	Total/NA	Water	7470A	314184
MB 160-314184/1-A	Method Blank	Total/NA	Water	7470A	314184
LCS 160-314184/2-A	Lab Control Sample	Total/NA	Water	7470A	314184
160-22867-A-1-B MS	Matrix Spike	Total/NA	Water	7470A	314184
160-22867-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	7470A	314184

Prep Batch: 316569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	3010A	
160-22870-2	B3B310	Total/NA	Water	3010A	
160-22870-3	B3B313	Total/NA	Water	3010A	
MB 160-316569/1-A	Method Blank	Total/NA	Water	3010A	
LCS 160-316569/2-A	Lab Control Sample	Total/NA	Water	3010A	
160-22866-A-1-B MS	Matrix Spike	Total/NA	Water	3010A	
160-22866-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	

Prep Batch: 316572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	3010A	
160-22870-2	B3B310	Total/NA	Water	3010A	
160-22870-3	B3B313	Total/NA	Water	3010A	
MB 160-316572/1-A	Method Blank	Total/NA	Water	3010A	
LCS 160-316572/2-A	Lab Control Sample	Total/NA	Water	3010A	
160-22866-A-1-E MS	Matrix Spike	Total/NA	Water	3010A	
160-22866-A-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	3010A	

Analysis Batch: 316808

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	6010C	316569
160-22870-2	B3B310	Total/NA	Water	6010C	316569
160-22870-3	B3B313	Total/NA	Water	6010C	316569
MB 160-316569/1-A	Method Blank	Total/NA	Water	6010C	316569
LCS 160-316569/2-A	Lab Control Sample	Total/NA	Water	6010C	316569
160-22866-A-1-B MS	Matrix Spike	Total/NA	Water	6010C	316569
160-22866-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	6010C	316569

Analysis Batch: 317281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-1	B3B306	Total/NA	Water	6020A	316572

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F12-023

TestAmerica Job ID: 160-22870-1
SDG: SL2557

Metals (Continued)

Analysis Batch: 317281 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-22870-2	B3B310	Total/NA	Water	6020A	316572
160-22870-3	B3B313	Total/NA	Water	6020A	316572
MB 160-316572/1-A	Method Blank	Total/NA	Water	6020A	316572
LCS 160-316572/2-A	Lab Control Sample	Total/NA	Water	6020A	316572
160-22866-A-1-E MS	Matrix Spike	Total/NA	Water	6020A	316572
160-22866-A-1-F MSD	Matrix Spike Duplicate	Total/NA	Water	6020A	316572