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: 160-23394-1
TestAmerica Sample Delivery Group: SL2591
Client Project/Site: F17-009

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

Attn: Mr. Scot Fitzgerald

Authorized for release by:
8/10/2017 1:32:18 PM

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Case Narrative

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
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Job ID: 160-23394-1

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
August 10, 2017
Attention: Scot Fitzgerald

SDG	: SL2591
Number of Samples	: 2 samples
Sample Matrix	: Soil
Data Deliverable	: Summary
Date SDG Closed	: July 19, 2017

II. Introduction

On July 19, 2 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: F17-009

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.

Case Narrative

Job ID: 160-23394-1 (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/radiochemistry analyses, the sample result is greater than the MDL/MDC but less than the RL.
- **B** - For organic analyses, Method Blank contamination. The Method Blank contains the target analyte above the MDL/RL and Method Blank is greater than 5% of the sample concentration.
- **B** - For inorganics and radiochemistry, Method Blank reported above the MDC/MDL.
- **J** - For organic analyses, the sample is estimated and less than the RL. If on Method Blank, indicates Method Blank contamination.
- **C** - For inorganics and radiochemistry analyses, Method Blank contamination. The Method Blank contains the target analyte at a concentration above the MDL/RL and Method Blank concentration is greater than 5% of the sample concentration.
- **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.

Volatiles

Batch: 318402

Due to the high concentration (above the upper calibration limit) of 4-Methyl-2-pentanone (MIBK) in the sample used for the MS/MSD, the sample/matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 160-318419 and analytical batch 160-318402 could not be reported. The associated laboratory control samples (LCS/LCSD) met acceptance criteria. (MB 160-318419/1-A)

Batch: 319162

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 160-319170 and analytical batch 160-319162. LCS/LCSD was performed to demonstrate accuracy and precision. B39WY2 (160-23394-2)

The following sample was analyzed at reduced volume due to high concentrations of target analytes: B39WY2 (160-23394-2). The reporting limits have been elevated by the appropriate factor. This analyte has been qualified accordingly with a "D" flag in the associated samples.

Case Narrative

Job ID: 160-23394-1 (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: 160-23394-1
SDG Number: SL2591

Login Number: 23394
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	

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F17-009-421	PAGE 1 OF 1
COLLECTOR Larry Rosane /CHPRC 82591	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9513, Core 14 FXR	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites Sampling - Soil 20		SAF NO. F17-009	AIR QUALITY ☐	30 Days / 30 Days
ICE CHEST NO. GWS-428	FIELD LOGBOOK NO. HNF-645-12-1	ACTUAL SAMPLE DEPTH NA	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. N/A			BILL OF LADING/AIR BILL NO. 779671563835	

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	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	Gs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B39WY4	SOIL	JUL 17 2017	1015	✓

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08/10/2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM Larry Rosane /CHPRC	DATE/TIME JUL 17 2017 1340	RECEIVED BY/STORED IN SSU-1	DATE/TIME JUL 17 2017 1340
RELINQUISHED BY/REMOVED FROM SSU-1	DATE/TIME JUL 18 2017 0700	RECEIVED BY/STORED IN Janelle Zunker CHPRC	DATE/TIME JUL 18 2017 0700
RELINQUISHED BY/REMOVED FROM Janelle Zunker CHPRC	DATE/TIME JUL 18 2017 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM Fed Ex	DATE/TIME	RECEIVED BY/STORED IN Jill Clark JillClark 7.19.17	DATE/TIME 0915
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-17-119;
* All VOA samples will be collected using EPA Method 5035A and will include 5 bottles for low level analysis.
** The laboratory is to use one of the low level VOA bottles for moisture content determination.
(1) 5035/8260_VOA: LOW LEVEL: COMMON {4-Methyl-2-pentanone};

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

8/10/2017
7 of 20

PRINTED ON 7/12/2017 | FSR ID = FSR44428 | TRVL NUM = TRVL-17-119 | A-6003-618 (REV 2)

REV.0

11 10 9 8 7 6 5 4 3 2 1

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION 10.5'

Location: C-9513 Coal 14 FXR

Sampler Initials and Date: 7-17-17 JJR

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B39WY4	K	29.69	35.02	5.33
	L	28.93	35.05	6.12
	M	29.03	36.18	7.15
	N	29.80	35.38	5.58
	P	29.55	36.83	7.28

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F17-009-420	PAGE 1 OF 1
COLLECTOR Larry Rosane /CHPRC SL2591	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H; DATA TURNAROUND; AIR QUALITY ☐; 30 Days / 30 Days
SAMPLING LOCATION C9513, Core 14	PROJECT DESIGNATION 200-DV-1 Operable Unit Characterization of Waste Sites Sampling - Soil 20		SAF NO. F17-009	
ICE CHEST NO. GWS-428	FIELD LOGBOOK NO. HNF-645-12-1	ACTUAL SAMPLE DEPTH 95FT – 100FT	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS; ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. 779671563835	

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
~~RADIOACTIVE TIE TO: B39WY0~~ N/A 7/17/17

PRESERVATION	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	Gs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B39WY2	SOIL	JUL 17 2017	~~JUL 17 2017~~ 1038

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Larry Rosane /CHPRC	JUL 17 2017 1346	Larry Rosane /CHPRC SSU-1	JUL 17 2017 1340
SSU-1	JUL 18 2017 0700	Janelle Zunker CHPRC	JUL 18 2017 0700
Janelle Zunker CHPRC	JUL 18 2017 1400	FEDEX	
Fed Ex		Jill Clark Jill Clark 7.19.17 0915	

SPECIAL INSTRUCTIONS
TRVL-17-119; SAMPLE B39WY1 & B39WY2 PORTION A, SAMPLE B39WY3 PORTION B
* All VOA samples will be collected using EPA Method 5035A and will include 5 bottles for low level analysis.
** The laboratory is to use one of the low level VOA bottles for moisture content determination.
(1) 5035/8260_VOA: LOW LEVEL: COMMON {4-Methyl-2-pentanone};

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

PRINTED ON 7/12/2017 | FSR ID = FSR44427 | TRVL NUM = TRVL-17-119 | A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: (C9513) 200-DV1

Sampler Initials and Date: DNS 7-17-17 1038 JUL 17 2017

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B39WY2	K	29.60	34.65	5.05
	L	29.44	35.06	5.62
	M	29.14	35.12	5.98
	N	29.66	35.07	5.41
	P	29.30	35.92	6.62

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

FedEx ® Tracking

779671563835

Ship date:
Tue 7/18/2017

RICHLAND, WA US

Delivered
Signed for by: B.DANIELS

Actual delivery:
Wed 7/19/2017 9:01 am

EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
▪ 7/19/2017 - Wednesday		
9:01 am	Delivered	EARTH CITY, MO
7:19 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:12 am	At local FedEx facility	EARTH CITY, MO
4:56 am	At destination sort facility	BERKELEY, MO
4:09 am	Departed FedEx location	MEMPHIS, TN
12:26 am	Arrived at FedEx location	MEMPHIS, TN
▪ 7/18/2017 - Tuesday		
4:47 pm	Left FedEx origin facility	PASCO, WA
3:20 pm	Picked up	PASCO, WA
10:41 am	Shipment information sent to FedEx	

Shipment Facts

Tracking number	779671563835	**Service**	FedEx Standard Overnight
Weight	50 lbs / 22.68 kgs	**Dimensions**	17x16x17 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	50 lbs / 22.68 kgs	**Terms**	Recipient
Shipper reference	GWS-428	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge	**Standard transit**	7/19/2017 by 3:00 pm

Definitions/Glossary

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Analyzed for but not detected.
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.

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: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL SL
Moisture	Percent Moisture	EPA	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

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: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-23394-1	B39WY4	Soil	07/17/17 10:15	07/19/17 09:15
160-23394-2	B39WY2	Soil	07/17/17 10:38	07/19/17 09:15

Client Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Method: 8260C - Volatile Organic Compounds by GC/MS

Client Sample ID: B39WY4
Date Collected: 07/17/17 10:15
Date Received: 07/19/17 09:15

Lab Sample ID: 160-23394-1
Matrix: Soil
Percent Solids: 100.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	0.68	U	19	0.68	ug/Kg	☼	07/20/17 15:12	07/20/17 21:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*67 - 132*	*07/20/17 15:12*	*07/20/17 21:44*	*1*
4-Bromofluorobenzene (Surr)	*113*		*59 - 150*	*07/20/17 15:12*	*07/20/17 21:44*	*1*
Dibromofluoromethane (Surr)	*97*		*53 - 143*	*07/20/17 15:12*	*07/20/17 21:44*	*1*
Toluene-d8 (Surr)	*116*		*74 - 135*	*07/20/17 15:12*	*07/20/17 21:44*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS - RADL

Client Sample ID: B39WY2
Date Collected: 07/17/17 10:38
Date Received: 07/19/17 09:15

Lab Sample ID: 160-23394-2
Matrix: Soil
Percent Solids: 81.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	**220000**	**D**	24000	500	ug/Kg	☼	07/25/17 20:09	07/25/17 23:02	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*59 - 127*	*07/25/17 20:09*	*07/25/17 23:02*	*20*
4-Bromofluorobenzene (Surr)	*77*		*69 - 145*	*07/25/17 20:09*	*07/25/17 23:02*	*20*
Dibromofluoromethane (Surr)	*90*		*71 - 126*	*07/25/17 20:09*	*07/25/17 23:02*	*20*
Toluene-d8 (Surr)	*75*		*75 - 136*	*07/25/17 20:09*	*07/25/17 23:02*	*20*

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 160-318419/1-A
Matrix: Solid
Analysis Batch: 318402

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 318419

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	0.73	U	20	0.73	ug/Kg		07/20/17 15:12	07/20/17 21:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*67 - 132*	*07/20/17 15:12*	*07/20/17 21:19*	*1*
4-Bromofluorobenzene (Surr)	*113*		*59 - 150*	*07/20/17 15:12*	*07/20/17 21:19*	*1*
Dibromofluoromethane (Surr)	*100*		*53 - 143*	*07/20/17 15:12*	*07/20/17 21:19*	*1*
Toluene-d8 (Surr)	*117*		*74 - 135*	*07/20/17 15:12*	*07/20/17 21:19*	*1*

Lab Sample ID: LCS 160-318419/2-A
Matrix: Solid
Analysis Batch: 318402

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 318419

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Methyl-2-pentanone (MIBK)	50.0	54.8		ug/Kg		110	67 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*113*		*67 - 132*
4-Bromofluorobenzene (Surr)	*97*		*59 - 150*
Dibromofluoromethane (Surr)	*100*		*53 - 143*
Toluene-d8 (Surr)	*107*		*74 - 135*

Lab Sample ID: LCSD 160-318419/3-A
Matrix: Solid
Analysis Batch: 318402

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 318419

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4-Methyl-2-pentanone (MIBK)	50.0	56.7		ug/Kg		113	67 - 130	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*115*		*67 - 132*
4-Bromofluorobenzene (Surr)	*97*		*59 - 150*
Dibromofluoromethane (Surr)	*103*		*53 - 143*
Toluene-d8 (Surr)	*107*		*74 - 135*

Lab Sample ID: MB 160-319170/1-A
Matrix: Solid
Analysis Batch: 319162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 319170

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methyl-2-pentanone (MIBK)	20	U	1000	20	ug/Kg		07/25/17 16:26	07/25/17 19:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*59 - 127*	*07/25/17 16:26*	*07/25/17 19:45*	*1*
4-Bromofluorobenzene (Surr)	*87*		*69 - 145*	*07/25/17 16:26*	*07/25/17 19:45*	*1*
Dibromofluoromethane (Surr)	*106*		*71 - 126*	*07/25/17 16:26*	*07/25/17 19:45*	*1*
Toluene-d8 (Surr)	*92*		*75 - 136*	*07/25/17 16:26*	*07/25/17 19:45*	*1*

QC Sample Results

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 160-319170/2-A
Matrix: Solid
Analysis Batch: 319162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 319170

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
4-Methyl-2-pentanone (MIBK)			2500	2580		ug/Kg		103	72 - 119		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*59 - 127*
4-Bromofluorobenzene (Surr)	*91*		*69 - 145*
Dibromofluoromethane (Surr)	*98*		*71 - 126*
Toluene-d8 (Surr)	*94*		*75 - 136*

Lab Sample ID: LCSD 160-319170/3-A
Matrix: Solid
Analysis Batch: 319162

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 319170

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4-Methyl-2-pentanone (MIBK)			2500	2580		ug/Kg		103	72 - 119	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*59 - 127*
4-Bromofluorobenzene (Surr)	*92*		*69 - 145*
Dibromofluoromethane (Surr)	*98*		*71 - 126*
Toluene-d8 (Surr)	*94*		*75 - 136*

QC Association Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

GC/MS VOA

Analysis Batch: 318402

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23394-1	B39WY4	Total/NA	Soil	8260C	318419
MB 160-318419/1-A	Method Blank	Total/NA	Solid	8260C	318419
LCS 160-318419/2-A	Lab Control Sample	Total/NA	Solid	8260C	318419
LCSD 160-318419/3-A	Lab Control Sample Dup	Total/NA	Solid	8260C	318419

Prep Batch: 318419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23394-1	B39WY4	Total/NA	Soil	5035	
MB 160-318419/1-A	Method Blank	Total/NA	Solid	5035	
LCS 160-318419/2-A	Lab Control Sample	Total/NA	Solid	5035	
LCSD 160-318419/3-A	Lab Control Sample Dup	Total/NA	Solid	5035	

Analysis Batch: 319162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23394-2 - RADL	B39WY2	Total/NA	Soil	8260C	319170
MB 160-319170/1-A	Method Blank	Total/NA	Solid	8260C	319170
LCS 160-319170/2-A	Lab Control Sample	Total/NA	Solid	8260C	319170
LCSD 160-319170/3-A	Lab Control Sample Dup	Total/NA	Solid	8260C	319170

Prep Batch: 319170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23394-2 - RADL	B39WY2	Total/NA	Soil	5030C	
MB 160-319170/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 160-319170/2-A	Lab Control Sample	Total/NA	Solid	5030C	
LCSD 160-319170/3-A	Lab Control Sample Dup	Total/NA	Solid	5030C	

General Chemistry

Analysis Batch: 319180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23394-1	B39WY4	Total/NA	Soil	Moisture	
160-23394-2	B39WY2	Total/NA	Soil	Moisture	
160-23523-A-2 DU	Duplicate	Total/NA	Solid	Moisture	

Surrogate Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(67-132)	(59-150)	(53-143)	(74-135)
160-23394-1	B39WY4	118	113	97	116

Surrogate Legend
12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Soil **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(59-127)	(69-145)	(71-126)	(75-136)
160-23394-2 - RADL	B39WY2	99	77	90	75

Surrogate Legend
12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(67-132)	(59-150)	(53-143)	(74-135)
LCS 160-318419/2-A	Lab Control Sample	113	97	100	107
LCSD 160-318419/3-A	Lab Control Sample Dup	115	97	103	107
MB 160-318419/1-A	Method Blank	117	113	100	117

Surrogate Legend
12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		12DCE	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(59-127)	(69-145)	(71-126)	(75-136)
LCS 160-319170/2-A	Lab Control Sample	99	91	98	94
LCSD 160-319170/3-A	Lab Control Sample Dup	98	92	98	94
MB 160-319170/1-A	Method Blank	111	87	106	92

Surrogate Legend
12DCE = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Surrogate Summary

Client: CH2M Hill Plateau Remediation Company
Project/Site: F17-009

TestAmerica Job ID: 160-23394-1
SDG: SL2591

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)