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: 160-23591-2
TestAmerica Sample Delivery Group: SL2607A
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:
3/2/2018 4:06:20 PM

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

LINKS

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

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

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Job ID: 160-23591-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

CH2MHill Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352
March 2, 2018
Attention: Scot Fitzgerald

SDG	: SL2607A
Number of Samples	: 2 samples
Sample Matrix	: Soil
Data Deliverable	: Summary
Date SDG Closed	: July 27, 2017

II. Introduction

Per SIR18-0488, it was determined that pH analysis needed to be added to the samples in this SDG. It is acknowledged per the SIR that the method will be run outside of hold time and temperature criteria.

Per SIR18-0506, it was determined that 6010 Metals analysis needed to be added to the samples in this SDG. It is acknowledged per the client that samples may be run outside of hold time due to length of time since original sampling date.

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.

Job ID: 160-23591-2 (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 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 inorganic 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.

ICP Metals

Batch: 352190

The following samples were analyzed outside of hold time due to analysis being requested after hold time expired. B3BMV1 (160-23591-4)

Due to the high concentration of Aluminum, Calcium, Iron and Magnesium, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 160-351868 and analytical batch 160-352190 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria. (160-23370-D-6-H MS ^) and (160-23370-D-6-I MSD) These analytes have been qualified accordingly with an "X" flag in the associated samples.

The following samples were diluted to bring the concentration of target analytes within the calibration range: B3BMV1 (160-23591-4), (160-23370-D-6-H MS ^), (160-23370-D-6-I MSD) and (160-23370-D-6-G SD ^). Elevated reporting limits (RLs) are provided. These analytes have been qualified accordingly with a "D" flag in the associated samples.

Batch: 352537

The following samples were analyzed outside of hold time due to analysis being requested after hold time expired. B3BMV1 (160-23591-4)

Job ID: 160-23591-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 160-352205 and analytical batch 160-352537 were outside control limits for Silicon. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. (160-23370-D-6-K MS ^) and (160-23370-D-6-L MSD) This analyte has been qualified accordingly with an "N" flag in the associated samples.

The following samples were diluted to bring the concentration of target analytes within the calibration range: B3BMV1 (160-23591-4), (160-23370-D-6-K MS ^), (160-23370-D-6-L MSD) and (160-23370-D-6-J SD ^). Elevated reporting limits (RLs) are provided. This analyte has been qualified accordingly with a "D" flag in the associated samples.

pH

Batch: 352560

Analysis for the following sample in pH soil preparation batch 160-352555 and analytical batch 160-352560 was requested by the client after the holding time had expired: B3BMV6 (160-23591-2).

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

SAMPLE ISSUE RESOLUTION (SIR) REPORT

SIR Number: SIR18-0488
Rev. Number: 0
Date Initiated: 02/15/2018

SAMPLE EVENT INFORMATION

SAF NUM(S): F17-009

LABORATORY: TASL

SAMPLING INFORMATION

NUMBER OF SAMPLES: 12

SAMPLE NUMBERS: B3BMP2, B3BMT5, B3BMV6, B3BMW7, B3D1H7, B3D1J3, B3D1L9, B3DCH1, B3DCJ6, B3DCK6, B3DCL1, B3DCM1

SAMPLE MATRIX: SOIL

SDG NUM(S): SL2590, SL2596, SL2607, SL2649, SL2658, SL2682, SL2697

ISSUE BACKGROUND

CLASS: General Laboratory Direction

TYPE: Addition of Analyses

DESCRIPTION: The project has determined the need to run pH on the sample(s) listed above. It is acknowledged that the method will be run outside of hold time.

RESOLUTION

PROPOSED RESOLUTION: Run pH as described above.

FINAL RESOLUTION: Accept proposed resolution

SUBMITTED BY:

FITZGERALD, SL 02/15/2018

ACCEPTED BY:

AWALT, JK 02/15/2018

SAMPLE ISSUE RESOLUTION (SIR) REPORT

SIR Number: SIR18-0506
Rev. Number: 0
Date Initiated: 02/26/2018

SAMPLE EVENT INFORMATION

SAF NUM(S): F17-009

LABORATORY: TASL

SAMPLING INFORMATION

NUMBER OF SAMPLES: 17

SAMPLE NUMBERS: B3BMN1, B3BMR4, B3BMV1, B3BMX4, B3D1H1, B3D1K6, B3D1L3, B3D1M6, B3DCJ1, B3DCK1, B3DCL6, B3DCM6, B3FC19, B3FCL4, B3FCM7, B3FLX1, B3FLX2

SAMPLE MATRIX: SOIL

SDG NUM(S): SL2590, SL2607, SL2612, SL2649, SL2658, SL2682, SL2697, SL2705, SL2732, SL2747

ISSUE BACKGROUND

CLASS: General Laboratory Direction

TYPE: Addition of Analyses

DESCRIPTION: The project has determined the need to run 6010_METALS_ICP_WE: COMMON for: Aluminum, Potassium, Barium, Manganese, Calcium, Magnesium, Iron, Sodium, Chromium and Silicon on the samples listed above.

RESOLUTION

PROPOSED RESOLUTION: Run metals analysis as described above.

FINAL RESOLUTION: Accept proposed resolution

SUBMITTED BY:

FITZGERALD, SL 02/26/2018

ACCEPTED BY:

AWALT, JK 02/26/2018

Login Sample Receipt Checklist

Client: CH2M Hill Plateau Remediation Company

Job Number: 160-23591-1
SDG Number: SL2607

Login Number: 23591
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.	N/A	
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	3.1
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			F17-009-678	PAGE 1 OF 1
COLLECTOR P. Brice SL2607	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9497, Core 28, B39LW6	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. NA	FIELD LOGBOOK NO. NA	ACTUAL SAMPLE DEPTH 186.5 - 188.5	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO.		

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	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14/40 Days	28 Days	28 Days
TYPE OF CONTAINER	Gs	aG	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	~~120mL~~ 4oz 7/25/17 AeM	120mL	250mL	~~60mL~~ 4oz 7/25/17 AeM
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	WTPH_KEROSENE: COMMON; ✓	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	350.1_AMMONIA: COMMON; 9012_CYANIDE: COMMON; ✓

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B3BMV0	SOIL	7/25/17	1030	X	X	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Patrick Brice PBS	7/25/17 1545	Angela McGuire PBS	7/25/17 1545
Angela McGuire PBS	7/26/17 0905	A. Rogers, TARL	7/26/17 0905
Bock J. Bock TARL	7-26-17 1330	FED EX	7-26-17
Fed Ex		J. Clarke	7.27.17 0910

SPECIAL INSTRUCTIONS
TRVL-17-175
(1) 8270_SVOA_GCMS: COMMON (Add-on) {Tributyl phosphate}; ✓
(2) 7471_MERCURY_CV: COMMON (SOLIDS); ✓ 6020_METALS_ICPMS: COMMON {Aluminum, ✓ Barium, ✓ Cadmium, ✓ Chromium, ✓ Copper, ✓ Lead, ✓ Selenium ✓}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, ✓ Arsenic ✓ Manganese, ✓ Nickel, ✓ Silver, ✓ Uranium ✓};

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

PRINTED ON 6/28/2017 FSR ID = FSR47551 TRVL NUM = TRVL-17-175 A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F17-009-684	PAGE 1 OF 1
COLLECTOR P. Brice 826607	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9497, Core 32, B39LX4	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. NA	FIELD LOGBOOK NO. NA	ACTUAL SAMPLE DEPTH 206.5-208.0	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO.		

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				Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C	
HOLDING TIME				14/40 Days	14/40 Days	28 Days	28 Days	
TYPE OF CONTAINER				Gs	aG	G/P	G/P	
NO. OF CONTAINER(S)				1	1	1	1	
VOLUME				~~120mL~~ 4oz 7/25/17 AOM	120mL	250mL	~~60mL~~ 4oz 7/25/17 AOM	
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	WTPH_KEROSENE: COMMON;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	350.1_AMMONIA: COMMON; 9012_CYANIDE: COMMON;	
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME					
B3BMV6	SOIL	7/25/17	1350	X	X	X	X	

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Patrick Brice PBS	7/25/17 1545	Angela McGuire Angela McGuire PBS	7/25/17 1545
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Angela McGuire Angela McGuire PBS	7/25/17 0905	A. Rogers, TAM	7/26/17 0905
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
J. Bock J. Bock TAM	7-26-17 1330	FED EX	7-26-17
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Fed Ex		Jill Clark Jill Clark	7-27-17 0910
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-17-175
(1) 8270_SVOA_GCMS: COMMON (Add-on) {Tributyl phosphate};
(2) 7471_MERCURY_CV: COMMON (SOLIDS); 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Copper, Lead, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Arsenic, Manganese, Nickel, Silver, Uranium};

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

PRINTED ON 6/28/2017 FSR ID = FSR47552 TRVL NUM = TRVL-17-175 A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F17-009-689	PAGE 1 OF 1
COLLECTOR P. Brice SL2607	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9497, Core 33, B39LX6	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. NA	FIELD LOGBOOK NO. NA	ACTUAL SAMPLE DEPTH 211.0-213.0	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO.		BILL OF LADING/AIR BILL NO.		

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	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14/40 Days	28 Days	28 Days
TYPE OF CONTAINER	Gs	aG	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	~~120mL~~ 4 oz 7/25/17 AGM	120mL	250mL	~~60mL~~ 4 oz 7/25/17 AGM
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	WTPH_KEROSENE: COMMON;	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	350.1_AMMONIA: COMMON; 9012_CYANIDE: COMMON;

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B3BMW1	SOIL	7/25/17	1520	X	X	X	X

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Patrick Brice PBS	7/25/17 1545	Angela McGuire PBS	7/25/17 1545
Angela McGuire PBS	7/25/17 0905	A. Rogers TARL	7/26/17 0905
J. Beck TARL	7-26-17 1330	FED EX	7-26-17
Fed Ex		Jill Clarke	7-27-17 0910

SPECIAL INSTRUCTIONS
TRVL-17-175
(1) 8270_SVOA_GCMS: COMMON (Add-on) {Tributyl phosphate};
(2) 7471_MERCURY_CV: COMMON (SOLIDS); 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Copper, Lead, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Antimony, Arsenic, Manganese, Nickel, Silver, Uranium};

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

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CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F17-009-679	PAGE 1 OF 1
COLLECTOR P. Brice 812607	COMPANY CONTACT FITZGERALD, SL	TELEPHONE NO. 373-7495	PROJECT COORDINATOR FITZGERALD, SL	PRICE CODE 8H	DATA TURNAROUND
SAMPLING LOCATION C9497, Core 28, B39LW6	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. NA	FIELD LOGBOOK NO. NA	ACTUAL SAMPLE DEPTH 186.5 - 188.5	COA 302632	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO TestAmerica St. Louis	OFFSITE PROPERTY NO. NA		BILL OF LADING/AIR BILL NO.		

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	Cool <=6C	None	Cool <=6C	None	Cool <=6C	Cool <=6C
HOLDING TIME	28 Days	6 Months	28 Days	ASAP	28 Days	28 Days
TYPE OF CONTAINER	aG	P	G/P	G/P	aG	aG
NO. OF CONTAINER(S)	1	1	1	1	1	1
VOLUME	120mL	~~60mL~~ 4 oz 7/25/17 ACM	250mL	~~60mL~~ 4 oz 7/25/17 ACM	120mL	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	SEE ITEM (3) IN SPECIAL INSTRUCTIONS	SEE ITEM (4) IN SPECIAL INSTRUCTIONS	9060_TIC_WE: COMMON {Total Inorganic Carbon}; ✓	9060_TOC_WE: COMMON {Total organic carbon}; ✓

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B3BMV1	SOIL	7/25/17	1030	X	X	X	X	X	X

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Patrick Brice PB 3	7/25/17 1545	Angela McGuire Angela McGuire PBS	7/25/17 1545
Angela McGuire Angela McGuire PBS	7/26/17 0905	A. Rogers TARI	7/26/17 0905
T. Beck TALR	7-26-17 1330	FED EX	7-26-17
Fed Ex		Jill Clarke Jill Clarke	7.27.17 0910

SPECIAL INSTRUCTIONS
TRVL-17-175; ** All Cations, TIC and TOC requesting Water Extraction (WE) shall use a 1:1 ratio.
(1) 9060_TIC: COMMON {Total Inorganic Carbon}; ✓ 9060_TOC: COMMON {Total organic carbon}; ✓
(2) 6010_METALS_ICP_WE: COMMON {Aluminum, ✓ Barium, ✓ Calcium, ✓ Chromium, ✓ Iron, ✓ Magnesium, ✓ Manganese, ✓ Potassium, ✓ Silicon, ✓ Sodium}; ✓
(3) 9050_CONDUCTIVITY_WE: COMMON {Specific Conductance}; ✓
(4) 9045_pH (Non-Aqueous)_WE: COMMON {pH Measurement}; ✓

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

PRINTED ON 6/28/2017 FSR ID = FSR47551 TRVL NUM = TRVL-17-175 A-6003-618 (REV 2)

03/02/2018 REV.0 3/2/2018

IMPORTANT!
FedEx is closely monitoring the wildfires in California. Learn More

FedEx ® Tracking

779742898135

Ship date:
Wed 7/26/2017

RICHLAND, WA US

Delivered
Signed for by: B.DANIELS

Actual delivery:
Thu 7/27/2017 9:03 am

EARTH CITY, MO US

Travel History

Date/Time	Activity	Location
- 7/27/2017 - Thursday		
9:03 am	Delivered	EARTH CITY, MO
7:18 am	On FedEx vehicle for delivery	EARTH CITY, MO
7:10 am	At local FedEx facility	EARTH CITY, MO
5:19 am	At destination sort facility	BERKELEY, MO
4:33 am	Departed FedEx location	MEMPHIS, TN
12:18 am	Arrived at FedEx location	MEMPHIS, TN
- 7/26/2017 - Wednesday		
4:50 pm	Left FedEx origin facility	PASCO, WA
3:54 pm	Shipment information sent to FedEx	
3:25 pm	Picked up	PASCO, WA

Shipment Facts

Tracking number	779742898135	**Service**	FedEx Standard Overnight
Weight	29 lbs / 13.15 kgs	**Dimensions**	19x11x14 in.
Delivered To	Shipping/Receiving	**Total pieces**	1
Total shipment weight	29 lbs / 13.15 kgs	**Terms**	Recipient
Shipper reference	CH2MHILL	**Packaging**	Your Packaging
Special handling section	Deliver Weekday, Additional Handling Surcharge	**Standard transit**	7/27/2017 by 3:00 pm

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Qualifiers

Metals

Qualifier	Qualifier Description
D	The reported value is from a dilution.
X	See case narrative notes for explanation of the 'X' flag
N	Recovery exceeds upper or lower control limits
Z	Sample was prepped or analyzed beyond the specified holding time
B	Estimated result. Result is less than the RL, but greater than MDL
U	Analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
Z	Sample was prepped or analyzed beyond the specified holding time

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: 160-23591-2
SDG: SL2607A

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL SL
9045D	pH	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: F17-009

TestAmerica Job ID: 160-23591-2
SDG: SL2607A

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-23591-2	B3BMV6	Soil	07/25/17 13:50	07/27/17 09:10
160-23591-4	B3BMV1	Soil	07/25/17 10:30	07/27/17 09:10

Client Sample Results

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

TestAmerica Job ID: 160-23591-2
SDG: SL2607A

Method: 6010C - Metals (ICP)

Client Sample ID: B3BMV1
Date Collected: 07/25/17 10:30
Date Received: 07/27/17 09:10

Lab Sample ID: 160-23591-4
Matrix: Soil
Percent Solids: 98.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	6000	D Z	89.9	22.5	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Barium	68.7	D Z	22.5	6.7	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Calcium	6500	D Z	1120	337	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Chromium	12.9	D Z	4.5	1.1	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Iron	15700	D Z	45.0	11.2	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Magnesium	5020	D Z	450	112	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Manganese	268	D Z	4.5	1.1	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Potassium	960	B D Z	2250	674	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5
Silicon	267	D Z N	195	48.8	mg/Kg	☼	02/21/18 09:18	02/22/18 11:58	5
Sodium	138	B D Z	450	112	mg/Kg	☼	02/19/18 12:12	02/20/18 16:23	5

General Chemistry

Client Sample ID: B3BMV6
Date Collected: 07/25/17 13:50
Date Received: 07/27/17 09:10

Lab Sample ID: 160-23591-2
Matrix: Soil

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.19	Z	0.100	0.100	SU		02/22/18 20:06	02/22/18 21:54	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 160-351868/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352190 — **Prep Batch: 351868**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	4.9	U	19.5	4.9	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Barium	1.5	U	4.9	1.5	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Calcium	73.2	U	244	73.2	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Chromium	0.24	U	0.98	0.24	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Iron	2.4	U	9.8	2.4	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Magnesium	24.4	U	97.7	24.4	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Manganese	0.24	U	0.98	0.24	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Potassium	146	U	488	146	mg/Kg		02/19/18 12:12	02/20/18 15:52	1
Sodium	24.4	U	97.7	24.4	mg/Kg		02/19/18 12:12	02/20/18 15:52	1

Lab Sample ID: LCSSRM 160-351868/2-A ^2 — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352190 — **Prep Batch: 351868**

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	8090	6068	D	mg/Kg		75.0	39.6 - 160.7
Barium	217	186.4	D	mg/Kg		85.9	73.7 - 128.1
Calcium	6010	4822	D	mg/Kg		80.2	73.7 - 126.3
Chromium	107	90.43	D	mg/Kg		84.5	69.4 - 134.6
Iron	14600	11090	D	mg/Kg		76.0	36.1 - 163.7
Magnesium	2930	2598	D	mg/Kg		88.7	65.9 - 134.5
Manganese	311	262.8	D	mg/Kg		84.5	74.9 - 125.4
Potassium	2620	2086	D	mg/Kg		79.6	61.1 - 138.9
Sodium	252	180.0	D	mg/Kg		71.4	32.9 - 167.5

Lab Sample ID: 160-23370-D-6-H MS ^5 — **Client Sample ID: Matrix Spike**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352190 — **Prep Batch: 351868**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	8900	D	1010	12520	D X	mg/Kg	☼	358	75 - 125
Barium	75.7	D	101	176.9	D	mg/Kg	☼	100	75 - 125
Calcium	8720	D	1010	10510	D X	mg/Kg	☼	177	75 - 125
Chromium	20.3	D	101	122.4	D	mg/Kg	☼	101	75 - 125
Iron	18100	D	1010	19440	D X	mg/Kg	☼	136	75 - 125
Magnesium	6610	D	1010	7925	D X	mg/Kg	☼	130	75 - 125
Manganese	356	D	101	464.1	D	mg/Kg	☼	106	75 - 125
Potassium	2080	B D	1010	3231	D	mg/Kg	☼	114	75 - 125
Sodium	2690	D	1010	3700	D	mg/Kg	☼	100	75 - 125

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 160-23370-D-6-I MSD ^5 — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352190 — **Prep Batch: 351868**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Aluminum	8900	D	1020	12430	D X	mg/Kg	☼	348	75 - 125	1	30
Barium	75.7	D	102	199.8	D	mg/Kg	☼	122	75 - 125	12	30
Calcium	8720	D	1020	10480	D X	mg/Kg	☼	174	75 - 125	0	30
Chromium	20.3	D	102	121.4	D	mg/Kg	☼	100	75 - 125	1	30
Iron	18100	D	1020	19340	D X	mg/Kg	☼	126	75 - 125	0	30
Magnesium	6610	D	1020	7870	D X	mg/Kg	☼	124	75 - 125	1	30
Manganese	356	D	102	464.8	D	mg/Kg	☼	107	75 - 125	0	30
Potassium	2080	B D	1020	3197	D	mg/Kg	☼	110	75 - 125	1	30
Sodium	2690	D	1020	3648	D	mg/Kg	☼	95	75 - 125	1	30

Lab Sample ID: MB 160-352205/1-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352537 — **Prep Batch: 352205**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silicon	9.7	U	38.9	9.7	mg/Kg		02/21/18 09:18	02/22/18 11:27	1

Lab Sample ID: LCS 160-352205/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352537 — **Prep Batch: 352205**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silicon	448	315.5		mg/Kg		70	27 - 107

Lab Sample ID: 160-23370-D-6-K MS ^5 — **Client Sample ID: Matrix Spike**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352537 — **Prep Batch: 352205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silicon	407	D N	512	470.6	D N	mg/Kg	☼	12	75 - 125

Lab Sample ID: 160-23370-D-6-L MSD ^5 — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352537 — **Prep Batch: 352205**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silicon	407	D N	507	409.9	D N	mg/Kg	☼	0.6	75 - 125	14	30

Method: 9045D - pH

Lab Sample ID: 160-24283-A-3-E DU — **Client Sample ID: Duplicate**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 352560 — **Prep Batch: 352555**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	9.99		10.08		SU		0.9	5

Method: 9045D - pH (Continued)

Lab Sample ID: LCS 160-352560/6
Matrix: Solid
Analysis Batch: 352560

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.050		SU		101	99.0 - 101.0		

QC Association Summary

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

TestAmerica Job ID: 160-23591-2
SDG: SL2607A

Metals

Prep Batch: 351868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-4	B3BMV1	Total/NA	Soil	3050B	
MB 160-351868/1-A	Method Blank	Total/NA	Solid	3050B	
LCSSRM 160-351868/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	
160-23370-D-6-H MS ^5	Matrix Spike	Total/NA	Solid	3050B	
160-23370-D-6-I MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 352190

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-4	B3BMV1	Total/NA	Soil	6010C	351868
MB 160-351868/1-A	Method Blank	Total/NA	Solid	6010C	351868
LCSSRM 160-351868/2-A ^2	Lab Control Sample	Total/NA	Solid	6010C	351868
160-23370-D-6-H MS ^5	Matrix Spike	Total/NA	Solid	6010C	351868
160-23370-D-6-I MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	6010C	351868

Prep Batch: 352205

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-4	B3BMV1	Total/NA	Soil	3050B	
MB 160-352205/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 160-352205/2-A	Lab Control Sample	Total/NA	Solid	3050B	
160-23370-D-6-K MS ^5	Matrix Spike	Total/NA	Solid	3050B	
160-23370-D-6-L MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 352537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-4	B3BMV1	Total/NA	Soil	6010C	352205
MB 160-352205/1-A	Method Blank	Total/NA	Solid	6010C	352205
LCS 160-352205/2-A	Lab Control Sample	Total/NA	Solid	6010C	352205
160-23370-D-6-K MS ^5	Matrix Spike	Total/NA	Solid	6010C	352205
160-23370-D-6-L MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	6010C	352205

General Chemistry

Prep Batch: 352555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-2	B3BMV6	Total/NA	Soil	DILeach_Prep	
160-24283-A-3-E DU	Duplicate	Total/NA	Solid	DILeach_Prep	

Analysis Batch: 352560

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-23591-2	B3BMV6	Total/NA	Soil	9045D	352555
LCS 160-352560/6	Lab Control Sample	Total/NA	Solid	9045D	
160-24283-A-3-E DU	Duplicate	Total/NA	Solid	9045D	352555