

5/26/2016



May 25, 2016

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF F15-053
Work Order: 396417
SDG: GEL396417

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 29, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300058 + 8H
Chain of Custody: F15-053-002 and F15-053-003
Enclosures



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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION

SIR NUM SIR16-333
REV NUM 0
DATE INITIATED 5/2/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) F15-053
OPERABLE UNIT(S) 200-WA-1
PROJECT(S) 200 Area GW
SAMPLE EVENT TITLE(S) 200 Area Groundwater Well Drilling Waste Designation
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 2
SAMPLE NUMBERS B32HF1, B32HF2
SAMPLE MATRIX
COLLECTION DATE -
SDG NUM GEL396417

ISSUE BACKGROUND

CLASS Field Sampling Issue
TYPE Analysis Hold Time Exceeded
DESCRIPTION The samples were collected on April 14, 2016 and received out of holding time on April 29, 2016 for VOCs and SVOCs

DISPOSITION

DESCRIPTION Proposed Resolution: Perform analysis and document the hold time excursion in the narrative.
JUSTIFICATION Final Disposition: Accept proposed resolution.

SUBMITTED BY: Edie Kent DATE: 04/29/2016
ACCEPTED BY: Scot Fitzgerald DATE: 05/02/2016

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF F15-053
SDG: GEL396417**

May 25, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on April 29, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. The client was notified that samples were received out of hold for VOCs and SVOCs. Please see the enclosed SIR for further details.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
396417001	B32HF1
396417002	B32HF2

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Diesel Range Organics, GC/MS Semivolatile, GC/MS Volatile, Metals and Radiochemistry.

We certify that this 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 signatures on this report.

5/26/2016

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417

GC/MS Volatile

Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Relative Percent Difference (RPD) Statement

The RPD between the matrix spike pair (See Below) were not all within the acceptance limits. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203545569PS and 1203545570PSD (B32HF2)	2-Butanone	30* (0%-20%)
	2-Hexanone	23* (0%-20%)
	Acetone	34* (0%-20%)

Technical Information

Holding Time Specifications

Samples 396417002 (B32HF2), 1203545569 (B32HF2PS), 1203545569 (B32HF2PS), 1203545570 (B32HF2PSD) and 1203545570 (B32HF2PSD) were received from the client beyond the required holding time period. The results are qualified accordingly.

Miscellaneous Information

Additional Comments

Ten milliliters of deionized waster was added to the samples prior to analysis. The samples were qualified with an 'X' qualifier because they were received from the client and analyzed out of holding.

GC/MS Semivolatile

Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) did not meet the 70%-130% spike recovery acceptance criteria per CPRC request. Each of these analytes was recovered within GEL's SPC limits. The data were reported.

Sample	Analyte	Value
1203539905 (LCS)	2,4-Dichlorophenol	69* (70%-130%)
	Pentachlorophenol	61* (70%-130%)
1203539906 (LCSD)	Pentachlorophenol	62* (70%-130%)

Technical Information**Holding Time Specifications**

Sample (See Below) was received from the client out of holding. The sample was analyzed and the data have been reported and qualified accordingly.

Sample	Analyte	Value
396417001 (B32HF1)	Several	See applicable report

Diesel Range Organics**Analysis of Diesel Range Organics by Flame Ionization Detector**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information**Holding Time Specifications**

Sample 396417001 (B32HF1) was received from the client out of holding.

Metals**Determination of Metals by ICP-MS**

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information**Sample Dilutions**

Sample 396417001 (B32HF1) was diluted to ensure that the analyte concentration was within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times.

Analyte	396417
	001
Several	40X 2X 10X

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Sample Dilutions

Sample 396417001 (B32HF1) was diluted to ensure that the analyte concentration was within the linear calibration range of the instrument.

Analyte	396417
	001
Mercury	20X

Radiochemistry

PUISO_PLATE_AEA:COMMON

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

UIISO_PLATE_AEA:COMMON

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Dry Weight

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Dry Weight

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

GAMMA_GS:COMMON

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

Refer to Miscellaneous Information.

Miscellaneous Information

SRISO_SEP_PRECIP_GPC: COMMON

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts

Sample 1203539657 (MB) was recounted due to a suspected blank false positive. The recount is reported.

9310_ALPHABETA_GPC: COMMON

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

The blank, 1203539670 (MB), did not meet the alpha nor beta detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits. The blank, 1203539670 (MB), alpha result is greater than the required detection limit but less than the MDC.

Technical Information

Gross Alpha/Beta Preparation Information

None of the samples have been flamed.

Recounts

Samples 1203539672 (B32HF1MS) and 1203539674 (LCS) were recounted due to high recovery. The recounts are reported.

TC99_SEP_GPC

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F15-053-003	PAGE 1 OF 1
COLLECTOR K.C. Patterson/CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6515	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9516, Interval 3 WASTE	PROJECT DESIGNATION 216-U-8 Uranium Sequestration Pilot Test Waste Designation - Soil	ACTUAL SAMPLE DEPTH (N/A)	SAF NO. F15-053	AIR QUALITY	
ICE CHEST NO. GWS-399	FIELD LOGBOOK NO. INF-N-491 15		COA 300058	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 4.14.16 6574	BILL OF LADING/AIR BILL NO. 4.14.16 776 217486505			

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	Frozen
A=Air	*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	14 Days
DL=Drum		TYPE OF CONTAINER	ags
Liquids		NO. OF CONTAINER(S)	5
DS=Drum		VOLUME	40mL
Solids		SAMPLE ANALYSIS	5035/8260_VOA : LOW LEVEL: COMMON;
L=Liquid		SAMPLE DATE	APR 14 2016
O=Oil		SAMPLE TIME	1110
S=Soil			✓
SE=Sediment	SPECIAL HANDLING AND/OR STORAGE		
T=Tissue	RADIOACTIVE TIE TO: B32HF0		
V=Vegetation			
W=Water			
WI=Wipe			
X=Other			

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B32HF2	SOIL	APR 14 2016	1110

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM K.C. Patterson/CHPRC	DATE/TIME APR 14 2016 1220	RECEIVED BY/STORED IN SSU-1 Freezer	DATE/TIME APR 14 2016 1220
RELINQUISHED BY/REMOVED FROM	DATE/TIME APR 28 2016 0850	RECEIVED BY/STORED IN J.C. Fulton/CHPRC	DATE/TIME APR 28 2016 0850
RELINQUISHED BY/REMOVED FROM	DATE/TIME APR 28 2016 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME 4/29/16 1155	RECEIVED BY/STORED IN J. Harley Monday	DATE/TIME 4/29/16 1155
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
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

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location:

C9516-216-U-8

Sampler Initials and Date: KP 4/14/16

Sample Number ¹	Sample Suffix	Initial Weight ² (grams)	Total Weight ³ (grams)	Soil Weight ⁴ (grams)
B32HF2	K	28.47	33.3	4.83
B32HF2	L	28.62	33.8	5.18
B32HF2	M	28.67	33.4	4.73
B32HF2	N	28.07	33.2	5.13
B32HF2	P	28.34	33.0	4.66

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)

SAMPLE RECEIPT & REVIEW FORM

EMA 4/29/16

Client: EPRE WRPS		SDG/AR/COC/Work Order: 390417	
Received By: <i>[Signature]</i>		Date Received: 4/29/16	
Suspected Hazard Information		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 2.5mR/hr	
Classified Radioactive II or III by RSO?		If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?		X B32HF1-rad 2, B32HF2-rad 1	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?		Hazard Class Shipped: UN#: 2910	
Samples identified as Foreign Soil?			

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius <input type="checkbox"/>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: 130532790 Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
7 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
8 Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
9 Samples received within holding time? 4/29/16 EMA	<input checked="" type="checkbox"/>			ID's and tests affected: SVOC + VOC rec'd out of holding
10 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
11 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
13 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
14 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
15 Carrier and tracking number.				Circle Applicable: FedEx Air <input checked="" type="checkbox"/> FedEx Ground UPS Field Services Courier Other 7762 1748 6505

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 25 May 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417**

Product: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 5035A/8260C

Analytical Procedure: GL-OA-E-038 REV# 22

Analytical Batch: 1566140

Preparation Method: SW846 5035A

Preparation Procedure: GL-OA-E-039 REV# 10

Preparation Batch: 1566139

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417002	B32HF2
1203545567	Method Blank (MB)
1203545568	Laboratory Control Sample (LCS)
1203545569	396417002(B32HF2) Post Spike (PS)
1203545570	396417002(B32HF2) Post Spike Duplicate (PSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Relative Percent Difference (RPD) Statement

The RPD between the matrix spike pair (See Below) were not all within the acceptance limits. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203545569PS and 1203545570PSD (B32HF2)	2-Butanone	30* (0%-20%)
	2-Hexanone	23* (0%-20%)
	Acetone	34* (0%-20%)

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. Samples 396417002 (B32HF2), 1203545569 (B32HF2PS), 1203545569 (B32HF2PS), 1203545570 (B32HF2PSD) and 1203545570 (B32HF2PSD) were received from the client beyond the required holding time period. The results are qualified

accordingly.

Miscellaneous Information

Additional Comments

Ten milliliters of deionized water was added to the samples prior to analysis. The samples were qualified with an 'X' qualifier because they were received from the client and analyzed out of holding.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL396417 GEL Work Order: 396417

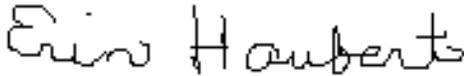
The Qualifiers in this report are defined as follows:

- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 18 MAY 2016

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL396417	Date Collected: 04/14/2016 11:10	Matrix: OTHERSOLID
Lab Sample ID: 396417002	Date Received: 04/29/2016 11:55	%Moisture: 1.1
Client ID: B32HF2	Client: CPRC001	Project: CPRC0F15053
Batch ID: 1566140	Method: SW846 5035A/8260C	SOP Ref: GL-OA-E-038
Run Date: 05/10/2016 11:16	Inst: VOA3.I	Dilution: 1
Prep Date: 04/14/2016 11:10	Analyst: CDS1	Purge Vol: 5 mL
Data File: 051016V3\3I209.D	Aliquot: 4.7 g	Final Volume: 5 mL
	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
71-55-6	1,1,1-Trichloroethane	UX	0.323	ug/kg	0.323	2.15
79-34-5	1,1,2,2-Tetrachloroethane	UX	0.323	ug/kg	0.323	2.15
79-00-5	1,1,2-Trichloroethane	UX	0.323	ug/kg	0.323	2.15
75-34-3	1,1-Dichloroethane	UX	0.323	ug/kg	0.323	2.15
75-35-4	1,1-Dichloroethylene	UX	0.323	ug/kg	0.323	2.15
107-06-2	1,2-Dichloroethane	JX	1.71	ug/kg	0.323	2.15
540-59-0	1,2-Dichloroethylene (total)	UX	0.323	ug/kg	0.323	4.30
78-87-5	1,2-Dichloropropane	UX	0.323	ug/kg	0.323	2.15
78-93-3	2-Butanone	UX	3.23	ug/kg	3.23	10.8
591-78-6	2-Hexanone	UX	3.23	ug/kg	3.23	10.8
108-10-1	4-Methyl-2-pentanone	UX	3.23	ug/kg	3.23	10.8
67-64-1	Acetone	UX	3.23	ug/kg	3.23	10.8
71-43-2	Benzene	UX	0.323	ug/kg	0.323	2.15
75-27-4	Bromodichloromethane	UX	0.323	ug/kg	0.323	2.15
75-25-2	Bromoform	UX	0.323	ug/kg	0.323	2.15
74-83-9	Bromomethane	UX	0.323	ug/kg	0.323	2.15
75-15-0	Carbon disulfide	UX	1.72	ug/kg	1.72	10.8
56-23-5	Carbon tetrachloride	UX	0.323	ug/kg	0.323	2.15
108-90-7	Chlorobenzene	UX	0.323	ug/kg	0.323	2.15
75-00-3	Chloroethane	UX	0.323	ug/kg	0.323	2.15
67-66-3	Chloroform	UX	0.323	ug/kg	0.323	2.15
74-87-3	Chloromethane	UX	0.323	ug/kg	0.323	2.15
124-48-1	Dibromochloromethane	UX	0.323	ug/kg	0.323	2.15
100-41-4	Ethylbenzene	UX	0.323	ug/kg	0.323	2.15
75-09-2	Methylene chloride	UX	1.72	ug/kg	1.72	5.38
100-42-5	Styrene	JX	0.430	ug/kg	0.323	2.15
127-18-4	Tetrachloroethylene	UX	0.323	ug/kg	0.323	2.15
108-88-3	Toluene	UX	0.323	ug/kg	0.323	2.15
79-01-6	Trichloroethylene	UX	0.323	ug/kg	0.323	2.15
75-01-4	Vinyl chloride	UX	0.323	ug/kg	0.323	2.15
1330-20-7	Xylenes (total)	UX	0.323	ug/kg	0.323	6.45
10061-01-5	cis-1,3-Dichloropropylene	UX	0.323	ug/kg	0.323	2.15
10061-02-6	trans-1,3-Dichloropropylene	UX	0.323	ug/kg	0.323	2.15

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: May 17, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 396417

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS										
Batch	1566140									
QC1203545568	LCS									
1,1,1-Trichloroethane	50.0		56.4	ug/kg		113	(70%-130%)	CDS1	05/10/16	08:11
1,1,2,2-Tetrachloroethane	50.0		50.6	ug/kg		101	(70%-130%)			
1,1,2-Trichloroethane	50.0		50.8	ug/kg		102	(70%-130%)			
1,1-Dichloroethane	50.0		53.3	ug/kg		107	(70%-130%)			
1,1-Dichloroethylene	50.0		57.8	ug/kg		116	(70%-130%)			
1,2-Dichloroethane	50.0		48.7	ug/kg		97	(70%-130%)			
1,2-Dichloroethylene (total)	100		105	ug/kg		105	(70%-130%)			
1,2-Dichloropropane	50.0		50.6	ug/kg		101	(70%-130%)			
2-Butanone	250		281	ug/kg		112	(70%-130%)			
2-Hexanone	250		306	ug/kg		122	(70%-130%)			
4-Methyl-2-pentanone	250		250	ug/kg		100	(70%-130%)			
Acetone	250		274	ug/kg		110	(70%-130%)			
Benzene	50.0		53.0	ug/kg		106	(70%-130%)			
Bromodichloromethane	50.0		51.6	ug/kg		103	(70%-130%)			
Bromoform	50.0		55.6	ug/kg		111	(70%-130%)			
Bromomethane	50.0		51.5	ug/kg		103	(70%-130%)			
Carbon disulfide	250		277	ug/kg		111	(70%-130%)			
Carbon tetrachloride	50.0		52.4	ug/kg		105	(70%-130%)			
Chlorobenzene	50.0		52.5	ug/kg		105	(70%-130%)			
Chloroethane	50.0		52.6	ug/kg		105	(70%-130%)			

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
Chloroform	50.0			51.5	ug/kg		103	(70%-130%)	CDS1	05/10/16	08:11
Chloromethane	50.0			49.0	ug/kg		98	(70%-130%)			
Dibromochloromethane	50.0			55.0	ug/kg		110	(70%-130%)			
Ethylbenzene	50.0			52.4	ug/kg		105	(70%-130%)			
Methylene chloride	50.0			52.6	ug/kg		105	(70%-130%)			
Styrene	50.0			53.1	ug/kg		106	(70%-130%)			
Tetrachloroethylene	50.0			52.7	ug/kg		105	(70%-130%)			
Toluene	50.0			53.6	ug/kg		107	(70%-130%)			
Trichloroethylene	50.0			55.5	ug/kg		111	(70%-130%)			
Vinyl chloride	50.0			48.3	ug/kg		97	(70%-130%)			
Xylenes (total)	150			159	ug/kg		106	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			54.1	ug/kg		108	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			53.4	ug/kg		107	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			47.7	ug/L		95	(81%-124%)			
**Bromofluorobenzene	50.0			50.8	ug/L		102	(70%-130%)			
**Toluene-d8	50.0			49.5	ug/L		99	(81%-120%)			
QC1203545567	MB										
1,1,1-Trichloroethane			U	0.300	ug/kg					05/10/16	10:25
1,1,2,2-Tetrachloroethane			U	0.300	ug/kg						
1,1,2-Trichloroethane			U	0.300	ug/kg						
1,1-Dichloroethane			U	0.300	ug/kg						
1,1-Dichloroethylene			U	0.300	ug/kg						

GEL LABORATORIES LLC

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QC Summary

Workorder: 396417

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
1,2-Dichloroethane			U	0.300	ug/kg				CDS1	05/10/16	10:25
1,2-Dichloroethylene (total)			U	0.300	ug/kg						
1,2-Dichloropropane			U	0.300	ug/kg						
2-Butanone			U	3.00	ug/kg						
2-Hexanone			U	3.00	ug/kg						
4-Methyl-2-pentanone			U	3.00	ug/kg						
Acetone			U	3.00	ug/kg						
Benzene			U	0.300	ug/kg						
Bromodichloromethane			U	0.300	ug/kg						
Bromoform			U	0.300	ug/kg						
Bromomethane			U	0.300	ug/kg						
Carbon disulfide			U	1.60	ug/kg						
Carbon tetrachloride			U	0.300	ug/kg						
Chlorobenzene			U	0.300	ug/kg						
Chloroethane			U	0.300	ug/kg						
Chloroform			U	0.300	ug/kg						
Chloromethane			U	0.300	ug/kg						
Dibromochloromethane			U	0.300	ug/kg						
Ethylbenzene			U	0.300	ug/kg						
Methylene chloride			U	1.60	ug/kg						
Styrene			U	0.300	ug/kg						

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 396417

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
Tetrachloroethylene			U	0.300	ug/kg						
Toluene			U	0.300	ug/kg				CDS1	05/10/16	10:25
Trichloroethylene			U	0.300	ug/kg						
Vinyl chloride			U	0.300	ug/kg						
Xylenes (total)			U	0.300	ug/kg						
cis-1,3-Dichloropropylene			U	0.300	ug/kg						
trans-1,3-Dichloropropylene			U	0.300	ug/kg						
**1,2-Dichloroethane-d4	50.0			49.1	ug/L		98	(81%-124%)			
**Bromofluorobenzene	50.0			49.8	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			49.3	ug/L		99	(81%-120%)			
QC1203545569 396417002 PS											
1,1,1-Trichloroethane	50.0	UX	0.00	X	47.4	ug/L	95	(70%-130%)		05/10/16	12:52
1,1,2,2-Tetrachloroethane	50.0	UX	0.00	X	54.1	ug/L	108	(70%-130%)			
1,1,2-Trichloroethane	50.0	UX	0.00	X	47.3	ug/L	95	(70%-130%)			
1,1-Dichloroethane	50.0	UX	0.00	X	47.5	ug/L	95	(70%-130%)			
1,1-Dichloroethylene	50.0	UX	0.00	X	49.8	ug/L	100	(70%-130%)			
1,2-Dichloroethane	50.0	JX	1.59	X	50.3	ug/L	97	(70%-130%)			
1,2-Dichloroethylene (total)	100	UX	0.00	X	92.9	ug/L	93	(70%-130%)			
1,2-Dichloropropane	50.0	UX	0.00	X	46.7	ug/L	93	(70%-130%)			
2-Butanone	250	UX	0.00	X	300	ug/L	120	(70%-130%)			
2-Hexanone	250	UX	0.00	X	291	ug/L	116	(70%-130%)			
4-Methyl-2-pentanone	250	UX	0.00	X	258	ug/L	103	(70%-130%)			
Acetone	250	UX	0.00	X	296	ug/L	118	(70%-130%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
Benzene	50.0	UX	0.00	X	46.2	ug/L	92	(70%-130%)	CDS1	05/10/16	12:52
Bromodichloromethane	50.0	UX	0.00	X	48.9	ug/L	98	(70%-130%)			
Bromoform	50.0	UX	0.00	X	55.4	ug/L	111	(70%-130%)			
Bromomethane	50.0	UX	0.00	X	43.3	ug/L	87	(70%-130%)			
Carbon disulfide	250	UX	0.00	X	238	ug/L	95	(70%-130%)			
Carbon tetrachloride	50.0	UX	0.00	X	44.7	ug/L	89	(70%-130%)			
Chlorobenzene	50.0	UX	0.00	X	43.7	ug/L	87	(70%-130%)			
Chloroethane	50.0	UX	0.00	X	45.4	ug/L	91	(70%-130%)			
Chloroform	50.0	UX	0.00	X	44.4	ug/L	89	(70%-130%)			
Chloromethane	50.0	UX	0.00	X	40.4	ug/L	81	(70%-130%)			
Dibromochloromethane	50.0	UX	0.00	X	50.2	ug/L	100	(70%-130%)			
Ethylbenzene	50.0	UX	0.00	X	43.3	ug/L	87	(70%-130%)			
Methylene chloride	50.0	UX	0.00	X	50.1	ug/L	100	(70%-130%)			
Styrene	50.0	JX	0.400	X	45.7	ug/L	91	(70%-130%)			
Tetrachloroethylene	50.0	UX	0.00	X	40.1	ug/L	80	(70%-130%)			
Toluene	50.0	UX	0.00	X	43.8	ug/L	88	(70%-130%)			
Trichloroethylene	50.0	UX	0.00	X	45.0	ug/L	90	(70%-130%)			
Vinyl chloride	50.0	UX	0.00	X	40.1	ug/L	80	(70%-130%)			
Xylenes (total)	150	UX	0.00	X	133	ug/L	88	(70%-130%)			
cis-1,3-Dichloropropylene	50.0	UX	0.00	X	49.1	ug/L	98	(70%-130%)			
trans-1,3-Dichloropropylene	50.0	UX	0.00	X	50.8	ug/L	102	(70%-130%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
**1,2-Dichloroethane-d4	50.0	56.7		48.8	ug/L		98	(81%-124%)			
**Bromofluorobenzene	50.0	53.2		51.8	ug/L		104	(70%-130%)	CDS1	05/10/16	12:52
**Toluene-d8	50.0	53.5		46.9	ug/L		94	(81%-120%)			
QC1203545570 396417002 PSD											
1,1,1-Trichloroethane	50.0	UX	0.00	X	42.3	ug/L	11	85	(0%-20%)		05/10/16 13:22
1,1,2,2-Tetrachloroethane	50.0	UX	0.00	X	47.6	ug/L	13	95	(0%-20%)		
1,1,2-Trichloroethane	50.0	UX	0.00	X	44.5	ug/L	6	89	(0%-20%)		
1,1-Dichloroethane	50.0	UX	0.00	X	45.3	ug/L	5	91	(0%-20%)		
1,1-Dichloroethylene	50.0	UX	0.00	X	42.7	ug/L	16	85	(0%-20%)		
1,2-Dichloroethane	50.0	JX	1.59	X	44.7	ug/L	12	86	(0%-20%)		
1,2-Dichloroethylene (total)	100	UX	0.00	X	85.2	ug/L	9	85	(0%-20%)		
1,2-Dichloropropane	50.0	UX	0.00	X	44.2	ug/L	6	88	(0%-20%)		
2-Butanone	250	UX	0.00	X	222	ug/L	30*	89	(0%-20%)		
2-Hexanone	250	UX	0.00	X	232	ug/L	23*	93	(0%-20%)		
4-Methyl-2-pentanone	250	UX	0.00	X	211	ug/L	20	84	(0%-20%)		
Acetone	250	UX	0.00	X	210	ug/L	34*	84	(0%-20%)		
Benzene	50.0	UX	0.00	X	42.4	ug/L	9	85	(0%-20%)		
Bromodichloromethane	50.0	UX	0.00	X	45.4	ug/L	7	91	(0%-20%)		
Bromoform	50.0	UX	0.00	X	49.8	ug/L	11	100	(0%-20%)		
Bromomethane	50.0	UX	0.00	X	43.5	ug/L	1	87	(0%-20%)		
Carbon disulfide	250	UX	0.00	X	205	ug/L	15	82	(0%-20%)		
Carbon tetrachloride	50.0	UX	0.00	X	39.4	ug/L	13	79	(0%-20%)		
Chlorobenzene	50.0	UX	0.00	X	39.8	ug/L	9	80	(0%-20%)		

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1566140										
Chloroethane	50.0	UX	0.00	X	39.7	ug/L	13	79	(0%-20%)	CDS1	05/10/16 13:22
Chloroform	50.0	UX	0.00	X	43.1	ug/L	3	86	(0%-20%)		
Chloromethane	50.0	UX	0.00	X	38.0	ug/L	6	76	(0%-20%)		
Dibromochloromethane	50.0	UX	0.00	X	46.2	ug/L	8	92	(0%-20%)		
Ethylbenzene	50.0	UX	0.00	X	37.2	ug/L	15	74	(0%-20%)		
Methylene chloride	50.0	UX	0.00	X	44.6	ug/L	12	89	(0%-20%)		
Styrene	50.0	JX	0.400	X	40.2	ug/L	13	80	(0%-20%)		
Tetrachloroethylene	50.0	UX	0.00	X	36.6	ug/L	9	73	(0%-20%)		
Toluene	50.0	UX	0.00	X	40.2	ug/L	9	80	(0%-20%)		
Trichloroethylene	50.0	UX	0.00	X	42.0	ug/L	7	84	(0%-20%)		
Vinyl chloride	50.0	UX	0.00	X	35.8	ug/L	11	72	(0%-20%)		
Xylenes (total)	150	UX	0.00	X	113	ug/L	16	75	(0%-20%)		
cis-1,3-Dichloropropylene	50.0	UX	0.00	X	45.1	ug/L	8	90	(0%-20%)		
trans-1,3-Dichloropropylene	50.0	UX	0.00	X	45.8	ug/L	10	92	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		56.7		45.9	ug/L		92	(81%-124%)		
**Bromofluorobenzene	50.0		53.2		51.8	ug/L		104	(70%-130%)		
**Toluene-d8	50.0		53.5		48.2	ug/L		96	(81%-120%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis

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QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
D	Results are reported from a diluted aliquot of sample.										
E	Concentration exceeds the calibration range of the instrument										
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated										
N	Spike Sample recovery is outside control limits.										
P	Aroclor target analyte with greater than 25% difference between column analyses.										
T	Spike and/or spike duplicate sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
o	Analyte failed to recover within LCS limits (Organics only)										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Surrogate Recovery Report

SDG Number: GEL396417

Matrix Type: SOLID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203545568	LCS for batch 1566139	95	99	102
1203545567	MB for batch 1566139	98	99	100
396417002	B32HF2	113	107	106
1203545569	B32HF2PS	98	94	104
1203545570	B32HF2PSD	92	96	104

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(81%-124%)

(81%-120%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417**

Product: Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method: 8270_SVOA_GCMS
Analytical Procedure: GL-OA-E-009 REV# 36
Analytical Batch: 1564075

Preparation Method: SW846 3541
Preparation Procedure: GL-OA-E-066 REV# 6
Preparation Batch: 1564074

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539904	Method Blank (MB)
1203539905	Laboratory Control Sample (LCS)
1203539906	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) did not meet the 70%-130% spike recovery acceptance criteria per CPRC request. Each of these analytes was recovered within GEL's SPC limits. The data were reported.

Sample	Analyte	Value
1203539905 (LCS)	2,4-Dichlorophenol	69* (70%-130%)
	Pentachlorophenol	61* (70%-130%)
1203539906 (LCSD)	Pentachlorophenol	62* (70%-130%)

Technical Information

Holding Time Specifications

Sample (See Below) was received from the client out of holding. The sample was analyzed and the data have been reported and qualified accordingly.

Sample	Analyte	Value
--------	---------	-------

396417001 (B32HF1)	Several	See applicable report
--------------------	---------	-----------------------

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL396417 GEL Work Order: 396417

The Qualifiers in this report are defined as follows:

- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: **Barbara Bailey**

Date: **24 MAY 2016**

Title: **Data Validator**

Sample Data Summary

Semi-Volatile
Certificate of Analysis
Sample Summary

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SDG Number: GEL396417	Date Collected: 04/14/2016 11:10	Matrix: OTHERSOLID
Lab Sample ID: 396417001	Date Received: 04/29/2016 11:55	%Moisture: 4.6
Client ID: B32HF1	Client: CPRC001	Project: CPRC0F15053
Batch ID: 1564075	Method: 8270_SVOA_GCMS	SOP Ref: GL-OA-E-009
Run Date: 05/05/2016 17:25	Inst: MSDA.I	Dilution: 1
Prep Date: 05/05/2016 10:30	Analyst: JMB3	Inj. Vol: 1 uL
Data File: 050516.s\Ae0510.D	Aliquot: 30.68 g	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
120-83-2	2,4-Dichlorophenol	UX	103	ug/kg	103	342
88-75-5	2-Nitrophenol	UX	103	ug/kg	103	342
91-20-3	Naphthalene	UX	10.3	ug/kg	10.3	34.2
87-86-5	Pentachlorophenol	UX	103	ug/kg	103	342
108-95-2	Phenol	UX	103	ug/kg	103	342
117-81-7	bis(2-Ethylhexyl)phthalate	UX	103	ug/kg	103	342
95-48-7	o-Cresol	UX	103	ug/kg	103	342

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: May 6, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 396417

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1564075										
QC1203539905	LCS										
2,4-Dichlorophenol	1670			1150	ug/kg		69*	(70%-130%)	JMB3	05/05/16	16:32
2-Nitrophenol	1670			1250	ug/kg		75	(70%-130%)			
Naphthalene	1670			1280	ug/kg		77	(70%-130%)			
Pentachlorophenol	1670			1010	ug/kg		61*	(70%-130%)			
Phenol	1670			1360	ug/kg		81	(70%-130%)			
bis(2-Ethylhexyl)phthalate	1670			1520	ug/kg		91	(70%-130%)			
o-Cresol	1670			1270	ug/kg		76	(70%-130%)			
**2,4,6-Tribromophenol	3330			2270	ug/kg		68	(12%-129%)			
**2-Fluorobiphenyl	1670			1290	ug/kg		77	(15%-110%)			
**2-Fluorophenol	3330			2450	ug/kg		73	(10%-115%)			
**Nitrobenzene-d5	1670			1260	ug/kg		76	(13%-112%)			
**Phenol-d5	3330			2510	ug/kg		75	(15%-117%)			
**p-Terphenyl-d14	1670			1410	ug/kg		85	(24%-141%)			
QC1203539906	LCSD										
2,4-Dichlorophenol	1670			1170	ug/kg	2	70	(0%-30%)		05/05/16	16:58
2-Nitrophenol	1670			1250	ug/kg	0	75	(0%-30%)			
Naphthalene	1670			1250	ug/kg	2	75	(0%-30%)			
Pentachlorophenol	1670			1030	ug/kg	3	62*	(0%-30%)			
Phenol	1670			1370	ug/kg	1	82	(0%-30%)			
bis(2-Ethylhexyl)phthalate	1670			1510	ug/kg	1	90	(0%-30%)			

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QC Summary

Workorder: 396417

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1564075										
o-Cresol	1670			1260	ug/kg	0	76	(0%-30%)			
**2,4,6-Tribromophenol	3330			2230	ug/kg		67	(12%-129%)	JMB3	05/05/16	16:58
**2-Fluorobiphenyl	1670			1240	ug/kg		74	(15%-110%)			
**2-Fluorophenol	3330			2390	ug/kg		72	(10%-115%)			
**Nitrobenzene-d5	1670			1210	ug/kg		72	(13%-112%)			
**Phenol-d5	3330			2460	ug/kg		74	(15%-117%)			
**p-Terphenyl-d14	1670			1360	ug/kg		82	(24%-141%)			
QC1203539904	MB										
2,4-Dichlorophenol			U	100	ug/kg					05/05/16	16:05
2-Nitrophenol			U	100	ug/kg						
Naphthalene			U	10.0	ug/kg						
Pentachlorophenol			U	100	ug/kg						
Phenol			U	100	ug/kg						
bis(2-Ethylhexyl)phthalate			U	100	ug/kg						
o-Cresol			U	100	ug/kg						
**2,4,6-Tribromophenol	3330			1660	ug/kg		50	(12%-129%)			
**2-Fluorobiphenyl	1670			1230	ug/kg		74	(15%-110%)			
**2-Fluorophenol	3330			2220	ug/kg		67	(10%-115%)			
**Nitrobenzene-d5	1670			1200	ug/kg		72	(13%-112%)			
**Phenol-d5	3330			2430	ug/kg		73	(15%-117%)			
**p-Terphenyl-d14	1670			1340	ug/kg		80	(24%-141%)			

Notes:

The Qualifiers in this report are defined as follows:

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
A	The TIC is a suspected aldol-condensation product										
B	The analyte was detected in both the associated QC blank and in the sample.										
C	Analyte has been confirmed by GC/MS analysis										
D	Results are reported from a diluted aliquot of sample.										
E	Concentration exceeds the calibration range of the instrument										
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated										
N	Spike Sample recovery is outside control limits.										
P	Aroclor target analyte with greater than 25% difference between column analyses.										
T	Spike and/or spike duplicate sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
o	Analyte failed to recover within LCS limits (Organics only)										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Surrogate Recovery Report

SDG Number: GEL396417

Matrix Type: SOLID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203539904	MB for batch 1564074	67	73	72	74	50	80
1203539905	LCS for batch 1564074	73	75	76	77	68	85
1203539906	LCSD for batch 1564074	72	74	72	74	67	82
396417001	B32HF1	68	74	73	77	60	84

Surrogate

2FP = 2-Fluorophenol
 PHL = Phenol-d5
 NBZ = Nitrobenzene-d5
 FBP = 2-Fluorobiphenyl
 TBP = 2,4,6-Tribromophenol
 TPH = p-Terphenyl-d14

Acceptance Limits

(10%-115%)
 (15%-117%)
 (13%-112%)
 (15%-110%)
 (12%-129%)
 (24%-141%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

FID Diesel Range Organics Analysis

Case Narrative

**Diesel Range Organics
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417**

Product: Analysis of Diesel Range Organics by Flame Ionization Detector

Analytical Method: WTPH_DIESEL

Analytical Procedure: GL-OA-E-003 REV# 26

Analytical Batch: 1568866

Preparation Method: SW846 3541

Preparation Procedure: GL-OA-E-010 REV# 25

Preparation Batch: 1568865

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203552746	Method Blank (MB)
1203552747	Laboratory Control Sample (LCS)
1203552748	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Holding Time Specifications

Sample 396417001 (B32HF1) was received from the client one day after the holding time expired. The data were reported with X qualifier.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL396417 GEL Work Order: 396417

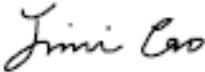
The Qualifiers in this report are defined as follows:

- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Jimin Cao

Date: 26 MAY 2016

Title: Data Validator

Sample Data Summary

**FID Diesel Range Organics
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: GEL396417	Date Collected: 04/14/2016 11:10	Matrix: OTHERSOLID
Lab Sample ID: 396417001	Date Received: 04/29/2016 11:55	%Moisture: 4.6
Client ID: B32HF1	Client: CPRC001	Project: CPRC0F15053
Batch ID: 1568866	Method: WTPH_DIESEL	SOP Ref: GL-OA-E-003
Run Date: 05/24/2016 13:23	Inst: FID7.I	Dilution: 1
Prep Date: 05/23/2016 10:28	Analyst: LXA1	Inj. Vol: 1 uL
Data File: 052416kero\7d2408.D	Aliquot: 30.13 g	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
8008-20-6	Kerosene	JX	2750	UG/KG	1160	6960

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: May 25, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 396417

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1568866										
QC1203552747	LCS										
Kerosene	33300			24000	UG/KG		72	(70%-130%)	LXA1	05/24/16	12:05
**o-Terphenyl	667			489	UG/KG		73	(60%-140%)			
QC1203552748	LCSD										
Kerosene	33300			27600	UG/KG	14	83	(0%-20%)		05/24/16	12:44
**o-Terphenyl	666			567	UG/KG		85	(60%-140%)			
QC1203552746	MB										
Kerosene			U	1110	UG/KG					05/24/16	11:27
**o-Terphenyl	666			432	UG/KG		65	(60%-140%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

GEL LABORATORIES LLC

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QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
-----------------	------------	---------------	-------------	-----------	--------------	-------------	-------------	--------------	--------------	-------------	-------------

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

FID Diesel Range Organics
Surrogate Recovery Report

SDG Number: GEL396417

Matrix Type: SOLID

Sample ID	Client ID	OTP %REC
1203552746	MB for batch 1568865	65
1203552747	LCS for batch 1568865	73
1203552748	LCSD for batch 1568865	85
396417001	B32HF1	86

Surrogate

OTP = o-Terphenyl

Acceptance Limits

(60%-140%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417

Product: Determination of Metals by ICP-MS**Analytical Method:** 6020_METALS_ICPMS**Analytical Procedure:** GL-MA-E-014 REV# 28**Analytical Batch:** 1564442**Product: Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer****Analytical Method:** 7471_HG_CVAA**Analytical Procedure:** GL-MA-E-010 REV# 31**Analytical Batch:** 1564487**Preparation Method:** SW846 3050B**Preparation Procedure:** GL-MA-E-009 REV# 26**Preparation Batch:** 1564441**Preparation Method:** SW846 7471B Prep**Preparation Procedure:** GL-MA-E-010 REV# 31**Preparation Batch:** 1564486

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203540811	Method Blank (MB)ICP-MS
1203540812	Laboratory Control Sample (LCS)
1203540813	Laboratory Control Sample Duplicate (LCSD)
1203540814	396417001(B32HF1L) Serial Dilution (SD)
1203540923	Method Blank (MB)CVAA
1203540924	Laboratory Control Sample (LCS)
1203540927	396492001(NonSDGL) Serial Dilution (SD)
1203540925	396492001(NonSDGS) Matrix Spike (MS)
1203540926	396492001(NonSDGSD) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information**Preparation/Analytical Method Verification**

Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples 396417001 (B32HF1)-ICP-MS and CVAA were diluted to ensure that the analyte concentrations were within the linear calibration range of the instrument. The ICPMS solid samples in this SDG were diluted the standard two times. ICP-MS.

Analyte	396417
	001
Several	40X 20X 2X 10X

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL396417 GEL Work Order: 396417

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Nik-Cole Elmore

Date: 24 MAY 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL396417

CONTRACT: CPRC0F15053

METHOD TYPE: SW846

SAMPLE ID:396417001

BASIS: Dry Weight

DATE COLLECTED 14-APR-16

CLIENT ID: B32HF1

LEVEL: Low

DATE RECEIVED 29-APR-16

MATRIX: OTHERSOLID

%SOLIDS: 95.4

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	8020000	ug/kg	D	14800	49500	49500	10	MS	SKJ	05/13/16 01:32	160512-2	1564442
7440-38-2	Arsenic	3990	ug/kg	D	198	989	989	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7440-39-3	Barium	28400	ug/kg	D	495	1980	1980	10	MS	SKJ	05/13/16 01:32	160512-2	1564442
7440-41-7	Beryllium	154	ug/kg	D	19.8	98.9	98.9	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7440-43-9	Cadmium	169	ug/kg	BD	19.8	198	198	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7440-47-3	Chromium	24300	ug/kg	D	989	2970	2970	10	MS	SKJ	05/13/16 01:32	160512-2	1564442
7440-48-4	Cobalt	6620	ug/kg	D	59.3	198	198	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7440-50-8	Copper	11900	ug/kg	D	65.3	198	198	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7439-92-1	Lead	6810	ug/kg	D	98.9	396	396	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7439-97-6	Mercury	1430	ug/kg	D	82.6	247	247	20	AV	MTM1	05/05/16 11:56	050516S1-3	1564487
7439-98-7	Molybdenum	361	ug/kg	D	59.3	198	198	2	MS	BCD1	05/14/16 00:31	160513-1	1564442
7782-49-2	Selenium	326	ug/kg	UD	326	989	989	2	MS	SKJ	05/13/16 01:51	160512-2	1564442
7440-61-1	Uranium	301000	ug/kg	D	261	791	791	40	MS	SKJ	05/13/16 01:12	160512-2	1564442

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1564442	1564441	SW846 3050B	0.53	g	50	mL	05/03/16	JP1
1564487	1564486	SW846 7471B Prep	0.51	g	30	mL	05/04/16	AXS5

***Analytical Methods:**

AV SW846 7471B

MS SW846 3050B/6020A

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: May 24, 2016

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 396417

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1564442										
QC1203540812	LCS										
Aluminum	197000		D	190000	ug/kg		96.3	(80%-120%)	SKJ	05/13/16	00:52
Arsenic	4920		D	4740	ug/kg		96.3	(80%-120%)			
Barium	4920		D	5010	ug/kg		102	(80%-120%)			
Beryllium	4920		D	5170	ug/kg		105	(80%-120%)			
Cadmium	4920		D	4850	ug/kg		98.6	(80%-120%)			
Chromium	4920		D	5150	ug/kg		105	(80%-120%)			
Cobalt	4920		D	5210	ug/kg		106	(80%-120%)			
Copper	4920		D	5330	ug/kg		108	(80%-120%)			
Lead	4920		D	5070	ug/kg		103	(80%-120%)			
Molybdenum	4920		D	5290	ug/kg		107	(80%-120%)	BCD1	05/14/16	00:24
Selenium	4920		D	4660	ug/kg		94.8	(80%-120%)	SKJ	05/13/16	00:52
Uranium	4920		D	5010	ug/kg		102	(34%-166%)			
QC1203540813	LCSD										
Aluminum	197000		D	185000	ug/kg	2.65	93.8	(0%-20%)		05/13/16	00:56
Arsenic	4920		D	4910	ug/kg	3.62	99.8	(0%-20%)			
Barium	4920		D	5020	ug/kg	0.173	102	(0%-20%)			
Beryllium	4920		D	5040	ug/kg	2.46	102	(0%-20%)			
Cadmium	4920		D	4880	ug/kg	0.51	99.1	(0%-20%)			
Chromium	4920		D	5060	ug/kg	1.67	103	(0%-20%)			
Cobalt	4920		D	5170	ug/kg	0.861	105	(0%-20%)			

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1564442										
Copper	4920		D	5290	ug/kg	0.601	108	(0%-20%)			
Lead	4920		D	5180	ug/kg	2.24	105	(0%-20%)	SKJ	05/13/16	00:56
Molybdenum	4920		D	5410	ug/kg	2.38	110	(0%-20%)	BCD1	05/14/16	00:27
Selenium	4920		D	4480	ug/kg	4.03	91	(0%-20%)	SKJ	05/13/16	00:56
Uranium	4920		D	5090	ug/kg	1.58	104	(0%-20%)			
QC1203540811	MB										
Aluminum			DU	2920	ug/kg					05/13/16	00:48
Arsenic			DU	195	ug/kg						
Barium			DU	97.3	ug/kg						
Beryllium			DU	19.5	ug/kg						
Cadmium			DU	19.5	ug/kg						
Chromium			DU	195	ug/kg						
Cobalt			DU	58.4	ug/kg						
Copper			DU	64.2	ug/kg						
Lead			DU	97.3	ug/kg						
Molybdenum			DU	58.4	ug/kg				BCD1	05/14/16	00:20
Selenium			DU	321	ug/kg				SKJ	05/13/16	00:48
Uranium			DU	12.8	ug/kg						
QC1203540814	396417001 SDILT										
Aluminum	D	8100	D	1680	ug/L	3.84		(0%-10%)		05/13/16	01:36
Arsenic	D	20.1	D	4.65	ug/L	15.3		(0%-10%)		05/13/16	01:59
Barium	D	28.7	D	5.82	ug/L	1.19		(0%-10%)		05/13/16	01:36
Beryllium	D	0.777	D	0.158	ug/L	1.67		(0%-10%)		05/13/16	01:59
Cadmium	BD	0.855	D	0.201	ug/L	17.5		(0%-10%)			

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QC Summary

Workorder: 396417

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1564442										
Chromium	D	24.6	D	4.63	ug/L	5.79		(0%-10%)	SKJ	05/13/16	01:36
Cobalt	D	33.5	D	7.28	ug/L	8.73		(0%-10%)		05/13/16	01:59
Copper	D	60.3	D	13.1	ug/L	8.37		(0%-10%)			
Lead	D	34.4	D	7.10	ug/L	3.11		(0%-10%)			
Molybdenum	D	1.83	D	0.350	ug/L	4.11		(0%-10%)	BCD1	05/14/16	00:38
Selenium	DU	-3.13	DU	1630	ug/L	N/A		(0%-10%)	SKJ	05/13/16	01:59
Uranium	D	76.1	D	15.3	ug/L	.795		(0%-10%)		05/13/16	01:16
Metals Analysis-Mercury											
Batch	1564487										
QC1203540924	LCS										
Mercury	107			110	ug/kg		103	(80%-120%)	MTM1	05/05/16	10:50
QC1203540923	MB										
Mercury			U	3.87	ug/kg					05/05/16	10:48
QC1203540925	396492001	MS									
Mercury	143	U	4.62	153	ug/kg		104	(80%-120%)		05/05/16	10:56
QC1203540926	396492001	MSD									
Mercury	150	U	4.62	162	ug/kg	5.57	105	(0%-20%)		05/05/16	13:29
QC1203540927	396492001	SDILT									
Mercury		U	0.065	DU	23.1	ug/L	N/A	(0%-10%)		05/05/16	11:00

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.

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QC Summary

Workorder: 396417

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
M											
N											
S											
U											
W											
X											
Y											
Z											

M Duplicate precision not met.

N Spike Sample recovery is outside control limits.

S Reported value determined by the Method of Standard Additions (MSA)

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396417
Work Order #: 396417

Product: PUIISO_PLATE_AEA:COMMON
Analytical Method: PUIISO_PLATE_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1563963

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1563949

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539641	Method Blank (MB)
1203539642	396417001(B32HF1) Sample Duplicate (DUP)
1203539643	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: UISO_PLATE_AEA:COMMON
Analytical Method: UISO_IE_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1563966

Preparation Method: Dry Soil Prep
Preparation Procedure: GL-RAD-A-021 REV# 20
Preparation Batch: 1563949

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539649	Method Blank (MB)
1203539650	396417001(B32HF1) Sample Duplicate (DUP)

1203539651 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Dry Weight

Analytical Method: ASTM D 2216 (Modified)

Analytical Procedure: GL-OA-E-020 REV# 10

Analytical Batch: 1563810

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417002	B32HF2
1203539204	396417002(B32HF2) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Dry Weight

Analytical Method: ASTM D 2216 (Modified)

Analytical Procedure: GL-OA-E-020 REV# 10

Analytical Batch: 1563950

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: GAMMA_GS:COMMON

Analytical Method: GAMMA_GS

Analytical Procedure: GL-RAD-A-013 REV# 25

Analytical Batch: 1563960

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1563949

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539633	Method Blank (MB)
1203539634	396417001(B32HF1) Sample Duplicate (DUP)
1203539635	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information.

Miscellaneous Information

1. The following RDLs in sample 396417001 were not achieved: Co-60, Eu-152, Eu-154 and Eu-155. The following RDLs in MB 1203539633 were not achieved: Cs-137, Co-60, Eu-152, Eu-154 and Eu-155. The following RDLs in DUP 1203539634 were not achieved: Co-60, Eu-152, Eu-154 and Eu-155. 1. The RDLs were not achieved due to low sample mass. Reporting results.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Data rejected due to no valid peak.	Cobalt-60	1203539634	B32HF1(396417001DUP)

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1563969

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1563949

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539657	Method Blank (MB)
1203539658	396417001(B32HF1) Sample Duplicate (DUP)
1203539659	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts

Sample 1203539657 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001B REV# 17

Analytical Batch: 1563974

Preparation Method: Dry Soil Prep

Preparation Procedure: GL-RAD-A-021 REV# 20

Preparation Batch: 1563949

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539670	Method Blank (MB)
1203539671	396417001(B32HF1) Sample Duplicate (DUP)
1203539672	396417001(B32HF1) Matrix Spike (MS)
1203539673	396417001(B32HF1) Matrix Spike Duplicate (MSD)

1203539674 Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The blank, 1203539670 (MB), did not meet the alpha nor beta detection limit due to keeping the blank volume consistent with the other sample aliquots. All other samples met the detection limits. The blank, 1203539670 (MB), alpha result is greater than the required detection limit but less than the MDC.

Technical Information

Gross Alpha/Beta Preparation Information

None of the samples have been flamed.

Recounts

Samples 1203539672 (B32HF1MS) and 1203539674 (LCS) were recounted due to high recovery. The recounts are reported.

Product: TC99_SEP_GPC

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1563975

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396417001	B32HF1
1203539675	Method Blank (MB)
1203539676	396417001(B32HF1) Sample Duplicate (DUP)
1203539677	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL396417 GEL Work Order: 396417

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Heather McCarty

Date: 24 MAY 2016

Title: Analyst II

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417
Lab Sample ID: 396417001

Client: CPRC001
Date Collected: 04/14/2016 11:10
Date Received: 04/29/2016 11:55

Project: CPRC0F15053
Matrix: OTHERSOLID
%Moisture: 4.6

Rad
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL396417
 Lab Sample ID: 396417001
 Client ID: B32HF1
 Batch ID: 1563960
 Run Date: 05/04/2016 11:23
 Data File: G396417001.CNF;1
 Prep Batch: 1563960
 Prep Date: 05/03/2016 00:00

Client: CPRC001
 Date Collected: 04/14/2016 11:10
 Date Received: 04/29/2016 11:55
 Method: GAMMA_GS
 Analyst: JXC5
 Aliquot: 14.3758 g
 Prep Method: DOE HASL 300, 4.5.2.3/Ga-01

Project: CPRC0F15053
 Matrix: OTHERSOLID
 %Moisture: 4.6
 Prep Basis: "Dry Weight Corrected"
 SOP Ref: GL-RAD-A-013
 Instrument: WELL
 Count Time: 240 min
 Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137		40700	pCi/g	+/-99.1	3420	16.6	0.100
10198-40-0	Cobalt-60	U	1.25	pCi/g	+/-2.27	2.28	2.32	0.050
14683-23-9	Europium-152	U	21.6	pCi/g	+/-47.4	48.4	74.2	0.100
15585-10-1	Europium-154	U	0.940	pCi/g	+/-3.91	3.93	7.31	0.100
14391-16-3	Europium-155	U	-6.01	pCi/g	+/-30.2	30.3	49.4	0.100

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417
Lab Sample ID: 396417001

Client: CPRC001
Date Collected: 04/14/2016 11:10
Date Received: 04/29/2016 11:55

Project: CPRC0F15053
Matrix: OTHERSOLID
%Moisture: 4.6

Client ID: B32HF1
Batch ID: 1563963
Run Date: 05/10/2016 09:43
Data File: S0396417001_PU.1A.gcnf
Prep Batch: 1563963
Prep Date: 05/09/2016 00:00

Method: PUIISO_PLATE_AEA
Analyst: JXC5
Aliquot: 0.08 g
Prep Method: DOE EML HASL-300, Pu-11-

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-011
Instrument: 1080
Count Time: 240 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.00	pCi/g	+/-0.150	0.151	0.224	1.00
OER-100-70	Plutonium-239/240	U	0.0954	pCi/g	+/-0.263	0.263	0.455	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	22.7	24.6	pCi/g	92.4	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The MDC is a sample specific MDC.

**Rad
Certificate of Analysis
Sample Summary**

SDG Number: GEL396417	Client: CPRC001	Project: CPRC0F15053
Lab Sample ID: 396417001	Date Collected: 04/14/2016 11:10	Matrix: OTHERSOLID
	Date Received: 04/29/2016 11:55	%Moisture: 4.6
Client ID: B32HF1		Prep Basis: "Dry Weight Corrected"
Batch ID: 1563966	Method: UIISO_IE_PRECIP_AEA	SOP Ref: GL-RAD-A-011
Run Date: 05/10/2016 09:21	Analyst: JXC5	Instrument: 1017
Data File: S0396417001_UU.1A.gcnf	Aliquot: 0.08 g	Count Time: 239.9998 min
Prep Batch: 1563966	Prep Method: DOE EML HASL-300, U-02-R	Prep SOP Ref: GL-RAD-A-021
Prep Date: 05/09/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
U-233/234 <small>13968-55-3/13966-29-5</small>	Uranium-233/234		87.3	pCi/g	+/-6.14	14.5	0.738	1.00
15117-96-1/13982-7	Uranium-235/236		7.03	pCi/g	+/-1.96	2.23	0.664	1.00
7440-61-1	Uranium-238		93.0	pCi/g	+/-6.33	15.4	0.537	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Uranium-232 Tracer	18.5	26.1	pCi/g	70.7	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma). The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417
Lab Sample ID: 396417001

Client: CPRC001
Date Collected: 04/14/2016 11:10
Date Received: 04/29/2016 11:55

Project: CPRC0F15053
Matrix: OTHERSOLID
%Moisture: 4.6

Client ID: B32HF1
Batch ID: 1563969
Run Date: 05/11/2016 16:06
Data File: S1563969r1.xls
Prep Batch: 1563969
Prep Date: 05/09/2016 00:00

Method: SRISO_SEP_PRECIP_GPC
Analyst: JXC5
Aliquot: 0.16 g
Prep Method: EPA 905.0 Modified/DOE RP5

Prep Basis: "Dry Weight Corrected"
SOP Ref: GL-RAD-A-004
Instrument: LB4100I1
Count Time: 60 min
Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		392	pCi/g	+/-13.7	73.6	3.33	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.40	7.77	mg	82.4	(40%-110%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417
 Lab Sample ID: 396417001

Client: CPRC001
 Date Collected: 04/14/2016 11:10
 Date Received: 04/29/2016 11:55

Project: CPRC0F15053
 Matrix: OTHERSOLID
 %Moisture: 4.6

Client ID: B32HF1
 Batch ID: 1563974
 Run Date: 05/12/2016 14:43
 Data File: AB1563974r2.xls
 Prep Batch: 1563974
 Prep Date: 05/12/2016 00:00

Method: 9310_ALPHABETA_GPC
 Analyst: JXC5
 Aliquot: 0.01526 g
 Prep Method: EPA 900.0/SW846 9310/SM 71

Prep Basis: "Dry Weight Corrected"
 SOP Ref: GL-RAD-A-001B
 Instrument: LB4100A1
 Count Time: 60 min
 Prep SOP Ref: GL-RAD-A-021

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA		151	pCi/g	+/-39.0	48.7	27.1	5.00
12587-47-2	Beta BETA		5480	pCi/g	+/-160	730	37.4	10.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417	Client: CPRC001	Project: CPRC0F15053
Lab Sample ID: 396417001	Date Collected: 04/14/2016 11:10	Matrix: OTHERSOLID
	Date Received: 04/29/2016 11:55	%Moisture: 4.6
Client ID: B32HF1		Prep Basis: "As Received"
Batch ID: 1563975	Method: TC99_EIE_LSC	SOP Ref: GL-RAD-A-059
Run Date: 05/08/2016 14:55	Analyst: JXC5	Instrument: LSCRED
Data File: E1563975.xls	Aliquot: 0.292 g	Count Time: 35 min
Prep Batch: 1563975	Prep Method: DOE EML HASL-300, Tc-02-	
Prep Date: 05/03/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-2.33	pCi/g	+/-6.95	6.95	12.1	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	39800	51000	CPM	77.9	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
 The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL396417
Lab Sample ID: 396417002

Client: CPRC001
Date Collected: 04/14/2016 11:10
Date Received: 04/29/2016 11:55

Project: CPRC0F15053
Matrix: OTHERSOLID
%Moisture: 1.1

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: May 24, 2016
Page 1 of 5

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 396417

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1563960								
QC1203539633	MB								
Cesium-137			U	0.413	pCi/g			JXC5	05/05/1606:26
				Uncert: +/-1.13					
				TPU: +/-1.15					
Cobalt-60			U	-0.555	pCi/g				
				Uncert: +/-1.04					
				TPU: +/-1.07					
Europium-152			U	-1.43	pCi/g				
				Uncert: +/-3.43					
				TPU: +/-3.49					
Europium-154			U	-2.88	pCi/g				
				Uncert: +/-3.27					
				TPU: +/-3.53					
Europium-155			U	-0.052	pCi/g				
				Uncert: +/-2.98					
				TPU: +/-2.98					
QC1203539634	396417001	DUP							
Cesium-137		40700		40500	pCi/g				05/04/1615:54
				Uncert: +/-99.1		RPD: 0	(0% - 20%)		
				TPU: +/-3420		RER: 0.065	(0-2)		
Cobalt-60		U 1.25	UX	0.00	pCi/g				
				Uncert: +/-2.27		RPD: 0	N/A		
				TPU: +/-2.28		RER: 1.99	(0-2)		
Europium-152		U 21.6	U	-10.5	pCi/g				
				Uncert: +/-47.4		RPD: 0	N/A		
				TPU: +/-48.4		RER: 0.958	(0-2)		
Europium-154		U 0.940	U	-0.931	pCi/g				
				Uncert: +/-3.91		RPD: 0	N/A		
				TPU: +/-3.93		RER: 0.65	(0-2)		
Europium-155		U -6.01	U	-17.1	pCi/g				
				Uncert: +/-30.2		RPD: 0	N/A		
				TPU: +/-30.3		RER: 0.5	(0-2)		
QC1203539635	LCS								
Americium-241	2120			2150	pCi/g	REC: 101	(80%-120%)		05/05/1606:39
				Uncert: +/-84.4					
				TPU: +/-195					
Cesium-137	713			732	pCi/g	REC: 103	(80%-120%)		
				Uncert: +/-41.1					
				TPU: +/-72.8					
Cobalt-60	549			546	pCi/g	REC: 99	(80%-120%)		
				Uncert: +/-40.2					
				TPU: +/-58.7					
Europium-152			U	9.50	pCi/g				
				Uncert: +/-18.4					
				TPU: +/-18.9					

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1563960								
Europium-154			U	4.63	pCi/g				
				Uncert:					
				TPU:					
Europium-155			U	0.135	pCi/g				
				Uncert:					
				TPU:					
Batch	1563963								
QC1203539641	MB								
Plutonium-238			U	0.131	pCi/g			JXC5	05/10/1609:43
				Uncert:					
				TPU:					
Plutonium-239/240			U	-0.0623	pCi/g				
				Uncert:					
				TPU:					
**Plutonium-242 Tracer		24.6		20.4	pCi/g	REC: 83 (30%-105%)			
				Uncert:					
				TPU:					
QC1203539642	396417001	DUP							
Plutonium-238		U 0.00	U	0.0215	pCi/g				05/10/1609:43
				Uncert:		RPD: 0 N/A			
				TPU:		RER: 0.156 (0-2)			
Plutonium-239/240		U 0.0954	U	0.542	pCi/g				
				Uncert:		RPD: 0 N/A			
				TPU:		RER: 1.57 (0-2)			
**Plutonium-242 Tracer		24.6	22.7	23.0	pCi/g	REC: 93 (30%-105%)			
				Uncert:					
				TPU:					
QC1203539643	LCS								
Plutonium-238				0.545	pCi/g				05/10/1609:43
				Uncert:					
				TPU:					
Plutonium-239/240		24.6		25.9	pCi/g	REC: 105 (80%-120%)			
				Uncert:					
				TPU:					
**Plutonium-242 Tracer		24.6		20.8	pCi/g	REC: 84 (30%-105%)			
				Uncert:					
				TPU:					
Batch	1563966								
QC1203539649	MB								
Uranium-233/234			U	0.292	pCi/g			JXC5	05/10/1609:21
				Uncert:					
				TPU:					
Uranium-235/236			U	0.180	pCi/g				
				Uncert:					
				TPU:					
Uranium-238			U	0.0663	pCi/g				
				Uncert:					
				TPU:					
**Uranium-232 Tracer		26.1		23.3	pCi/g	REC: 89 (30%-105%)			

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1563966								
		Uncert:		+/-2.92					
		TPU:		+/-4.58					
QC1203539650	396417001	DUP							
Uranium-233/234		87.3		76.7	pCi/g				05/10/1609:21
		Uncert:	+/-6.14	+/-4.81		RPD: 13	(0% - 20%)		
		TPU:	+/-14.5	+/-11.2		RER: 1.13	(0-2)		
Uranium-235/236		7.03		6.09	pCi/g				
		Uncert:	+/-1.96	+/-1.52		RPD: 14	(0% - 20%)		
		TPU:	+/-2.23	+/-1.72		RER: 0.657	(0-2)		
Uranium-238		93.0		80.7	pCi/g				
		Uncert:	+/-6.33	+/-4.94		RPD: 14	(0% - 20%)		
		TPU:	+/-15.4	+/-11.8		RER: 1.24	(0-2)		
**Uranium-232 Tracer	26.1	18.5		25.5	pCi/g	REC: 98	(30%-105%)		
		Uncert:	+/-3.40	+/-2.83					
		TPU:	+/-5.20	+/-4.47					
QC1203539651	LCS								
Uranium-233/234				32.7	pCi/g				
		Uncert:		+/-3.24					
		TPU:		+/-5.48					
Uranium-235/236				2.13	pCi/g				
		Uncert:		+/-0.945					
		TPU:		+/-0.988					
Uranium-238	33.7			36.1	pCi/g	REC: 107	(80%-120%)		
		Uncert:		+/-3.40					
		TPU:		+/-5.96					
**Uranium-232 Tracer	26.1			23.0	pCi/g	REC: 88	(30%-105%)		
		Uncert:		+/-2.92					
		TPU:		+/-4.58					
Batch	1563969								
QC1203539657	MB								
Strontium-90			U	0.0923	pCi/g			JXC5	05/23/1616:09
		Uncert:		+/-0.669					
		TPU:		+/-0.669					
**Strontium Carrier	7.77			6.40	mg	REC: 82	(40%-110%)		
QC1203539658	396417001	DUP							
Strontium-90		392		348	pCi/g				05/11/1616:10
		Uncert:	+/-13.7	+/-11.7		RPD: 12	(0% - 20%)		
		TPU:	+/-73.6	+/-68.3		RER: 0.859	(0-2)		
**Strontium Carrier	7.77	6.40		6.80	mg	REC: 88	(40%-110%)		
QC1203539659	LCS								
Strontium-90		137		139	pCi/g	REC: 101	(80%-120%)		
		Uncert:		+/-7.68					
		TPU:		+/-28.3					
**Strontium Carrier	7.77			6.40	mg	REC: 82	(40%-110%)		
Batch	1563974								
QC1203539670	MB								
Alpha			U	9.49	pCi/g			JXC5	05/12/1614:43
		Uncert:		+/-13.4					
		TPU:		+/-13.5					
Beta			U	-1.77	pCi/g				

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
High Rad Testing									
Batch	1563974								
		Uncert:		+/-19.4					
		TPU:		+/-19.4					
QC1203539671	396417001	DUP							
Alpha		151		130	pCi/g				05/12/1614:43
		Uncert:	+/-39.0	+/-38.6		RPD: 14	(0% - 20%)		
		TPU:	+/-48.7	+/-46.3		RER: 0.592	(0-2)		
Beta		5480		5270	pCi/g				
		Uncert:	+/-160	+/-156		RPD: 4	(0% - 20%)		
		TPU:	+/-730	+/-694		RER: 0.418	(0-2)		
QC1203539672	396417001	MS							
Alpha		797	151	1030	pCi/g	REC: 110	(75%-125%)		05/24/1608:50
		Uncert:	+/-39.0	+/-92.8					
		TPU:	+/-48.7	+/-211					
Beta		2880	5480	8690	pCi/g	REC: 111	(75%-125%)		
		Uncert:	+/-160	+/-193					
		TPU:	+/-730	+/-1100					
QC1203539673	396417001	MSD							
Alpha		797	151	1130	pCi/g	REC: 123	(75%-125%)		05/12/1614:42
		Uncert:	+/-39.0	+/-97.0		RPD: 9	(0%-20%)		
		TPU:	+/-48.7	+/-238		RER: 0.617	(0-2)		
Beta		2880	5480	8260	pCi/g	REC: 97	(75%-125%)		
		Uncert:	+/-160	+/-188		RPD: 5	(0%-20%)		
		TPU:	+/-730	+/-1060		RER: 0.545	(0-2)		
QC1203539674	LCS								
Alpha		797		759	pCi/g	REC: 95	(80%-120%)		05/24/1611:56
		Uncert:		+/-73.8					
		TPU:		+/-167					
Beta		2880		3450	pCi/g	REC: 120	(80%-120%)		
		Uncert:		+/-121					
		TPU:		+/-449					
Batch	1563975								
QC1203539675	MB								
Technetium-99			U	-4.43	pCi/g			JXC5	05/08/1615:32
		Uncert:		+/-6.91					
		TPU:		+/-6.91					
**Technetium-99m Tracer		51000		39600	CPM	REC: 78	(30%-105%)		
QC1203539676	396417001	DUP							
Technetium-99		U	-2.33	U	-2.14	pCi/g			05/08/1616:09
		Uncert:	+/-6.95	+/-7.23		RPD: 0	N/A		
		TPU:	+/-6.95	+/-7.23		RER: 0.0378	(0-2)		
**Technetium-99m Tracer		51000	39800	39700	CPM	REC: 78	(30%-105%)		
QC1203539677	LCS								
Technetium-99		295		290	pCi/g	REC: 98	(80%-120%)		05/08/1616:47
		Uncert:		+/-12.7					
		TPU:		+/-36.2					
**Technetium-99m Tracer		51000		40400	CPM	REC: 79	(30%-105%)		

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
*						Duplicate analysis not within control limits				
+						Correlation coefficient for Method of Standard Additions (MSA) is < 0.995				
A						The TIC is a suspected aldol-condensation product				
B						The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).				
B						The analyte was detected in both the associated QC blank and in the sample.				
B						The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample				
C						Analyte has been confirmed by GC/MS analysis				
C						Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.				
D						Results are reported from a diluted aliquot of sample.				
E						Concentration exceeds the calibration range of the instrument				
E						Reported value is estimated due to interferences. See comment in narrative.				
J						The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated				
M						Duplicate precision not met.				
N						Spike Sample recovery is outside control limits.				
P						Aroclor target analyte with greater than 25% difference between column analyses.				
S						Reported value determined by the Method of Standard Additions (MSA)				
T						Spike and/or spike duplicate sample recovery is outside control limits.				
U						Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.				
UX						Gamma Spectroscopy--Uncertain identification				
W						Post-digestion spike recovery for GFAA out of control limit. Sample absorbency $< 50\%$ of spike absorbency.				
X						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
Y						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
Z						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
o						Analyte failed to recover within LCS limits (Organics only)				

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.