

June 24, 2016



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June 23, 2016

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

Re: CHPRC SAF F16-043  
Work Order: 399218  
SDG: GEL399218

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 11, 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,

A handwritten signature in black ink that reads "Heather Shaffer". The signature is written in a cursive, flowing style.

Heather Shaffer  
Project Manager

Purchase Order: 304070 - 8C  
Chain of Custody: F16-043-064  
Enclosures



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# Sample Issue Resolution

<b>SAMPLE ISSUE RESOLUTION</b>	<b>SIR NUM</b>	SIR16-440
	<b>REV NUM</b>	0
	<b>DATE INITIATED</b>	6/22/2016

**SAMPLE EVENT INFORMATION**

**SAF NUM(S)** F16-043  
**OPERABLE UNIT(S)** 100-NR-2  
**PROJECT(S)** 100-NR-2 GW  
**SAMPLE EVENT TITLE(S)** 100-NR-2 Well Drilling and Installation of Wells  
**LABORATORY** GEL Laboratories, LLC

**SAMPLING INFORMATION**

**NUMBER OF SAMPLES** 1  
**SAMPLE NUMBERS** B35YB7  
**SAMPLE MATRIX** SOIL  
**COLLECTION DATE** 6/9/2016 - 6/9/2016  
**SDG NUM** GEL399218

**ISSUE BACKGROUND**

**CLASS** Laboratory Issue  
**TYPE** Quality Control Failure  
**DESCRIPTION** The method blank has a detect of Aliphatic Hydrocarbons C8-C10 above the PQL. The samples also have similar detects. There is a small pattern in this RT range. The small pattern appears to have come over during the extraction process and is not indigenous to these samples.

**DISPOSITION**

**DESCRIPTION** Proposed Resolution: Initiate SIR, report results and include a detailed comment in the case narrative.  
**JUSTIFICATION** Final Disposition: Accept proposed resolution.  
 SUBMITTED BY: Heather Shaffer DATE: 06/22/2016  
 ACCEPTED BY: Scot Fitzgerald DATE: 06/22/2016

# Case Narrative

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF F16-043  
SDG: GEL399218

June 23, 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 June 11, 2016, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Please see the enclosed SIR regarding QC issues..

**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 sample:

<b><u>Laboratory Identification</u></b>	<b><u>Sample Description</u></b>
399218001	B35YB7

**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, FID Flame Ionization Detector, GC/MS Semivolatile, General Chemistry 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.

**June 24, 2016**

*Heather Shaffer*

Heather Shaffer  
Project Manager

Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399218  
Work Order #: 399218

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

Sample	Analyte	Value
1203569970 (LCS)	Benzo(a)pyrene	65* (70%-130%)
	Benzo(k)fluoranthene	58* (70%-130%)

**Miscellaneous Information**

**Manual Integrations**

Sample 399218001 (B35YB7) required manual integration to correctly position the baseline as set in the calibration standard injections.

**FID Flame Ionization Detector**

**Washington Method for the Determination of Extractable Petroleum Hydrocarbons**

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**

**Method Blank (MB) Statement**

Method blank 1203569837 (MB) contained a hit of Aliphatics Hydrocarbons C8-C10 just above the RDL. A similar concentration of Aliphatics Hydrocarbons C8-C10 was present in all client samples. The source of contamination was likely from impurities in one or more of the solvents used for the extractions and fractionations. Detects in samples were B qualified and should be considered as false positives.

**Matrix Spike (MS) Recovery Statement**

The MSD (See Below) recovery was not within the acceptance limits due to sample matrix interference. The MS

and LCS recoveries were within acceptance limits. The data were reported.

Sample	Analyte	Value
1203569840 (B35YC2MSD)	Aromatic Hydrocarbons >C10-C12	64* (70%-130%)

**MS/MSD Relative Percent Difference (RPD) Statement**

The relative percent differences (RPD) between the MS and MSD (See Below) were not within the required acceptance limits. The MSD recovery was below acceptance limits, while the MS recovery passed. The LCS recovery also passed. The data were reported.

Sample	Analyte	Value
1203569839MS and 1203569840MSD (B35YC2)	Aromatic Hydrocarbons >C10-C12	26* (0%-20%)

The relative percent differences (RPD) between the MS and MSD (See Below) were not within the required acceptance limits. The individual recoveries in the MS and MSD were within acceptance limits. The data were reported.

Sample	Analyte	Value
1203569839MS and 1203569840MSD (B35YC2)	Aromatic Hydrocarbons >C12-C16	26* (0%-20%)
	Aromatic Hydrocarbons >C16-C21	22* (0%-20%)

**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.

**Miscellaneous Information**

**Manual Integrations**

Samples 1203568491 (LCS), 1203568492 (Non SDG 399360001MS) and 1203568493 (Non SDG 399360001MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

**General Chemistry**

**pH**

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 Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203565526 (B35VN3DUP)	pH	Received 08-JUN-16, out of holding 07-JUN-16
399218001 (B35YB7)	pH	Received 11-JUN-16, out of holding 09-JUN-16

**Radiochemistry**

**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.

**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**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

CH2M Hill Plateau Remediation Company  
 COLLECTOR: J.R. Aguilera/CHPRC  
 COMPANY CONTACT: TODAYAK, D  
 TELEPHONE NO.: 376-6427  
 PROJECT COORDINATOR: TODAYAK, D

SAMPLING LOCATION: C9402, I-001  
 PROJECT DESIGNATION: 100-NR-2 Drilling - Soil  
 SAF NO.: F16-043

ICE CHEST NO.: 605-300  
 FIELD LOGBOOK NO.:  
 ACTUAL SAMPLE DEPTH: 10.1' - 13.1'

SHIPPED TO: GEL Laboratories, LLC  
 OFFSITE PROPERTY NO.: 6716  
 COA: 304070  
 METHOD OF SHIPMENT: FEDERAL EXPRESS  
 AIR QUALITY:  15 Days / 15 Days  
 PRICE CODE: 8C  
 DATA TURNAROUND: 15 Days / 15 Days  
 F16-043-064  
 PAGE 1 OF 1

7764 96768 3868  
 399218

MATRIX*	PRESERVATION	Cool <=6C		NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS	SPECIAL HANDLING AND/OR STORAGE	SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
		14/40 Days	14/40 Days								
POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1. NA	None	None	None	1	250ml	8770-SVDA_GC MS_SLM; COMMON;		B35YB7		JUN 09 2016	1330
	None	None	None	1	120ml	VTPL_DIESEL; COMMON; OIL; COMMON;					
	None	None	None	1	120ml	VTPL_DIESEL; COMMON; OIL; COMMON;					
	None	None	None	1	200g	9045_pH (Non-Aqueous); COMMON;					

**SPECIAL INSTRUCTIONS**  
 SPLIT SPOON PARTS B & A WILL BE COMBINED TO ENSURE ADEQUATE SAMPLE MATERIAL FOR ANALYSIS;  
 (1) Moisture Content - D2216 {Percent moisture (wet sample)};

**CHAIN OF POSSESSION**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
SSU-1	JUN 09 2016 1330	SSU B1	SSU B1	JUN 09 2016 1330
SSU-1	JUN 10 2016 1030	Leah Wall / Leah Wall	Leah Wall / Leah Wall	JUN 10 2016 1030
SSU-1	JUN 10 2016 1400	Leah Wall / Leah Wall	FEDEX	JUN 10 2016 0900
SSU-1	JUN 10 2016 1400	Leah Wall / Leah Wall	M. Gibson / Leah Wall	JUN 10 2016 0900

LABORATORY SECTION: RECEIVED BY: TITLE: DATE/TIME

FINAL SAMPLE DISPOSITION: DISPOSAL METHOD: DATE/TIME

PRINTED ON 6/8/2016 FSR ID = FSR33109 TRVL NUM = TRVL-16-168 A-6003-618 (REV 2)

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>OPRC</u>		SDG/AR/COC/Work Order: <u>319218</u>	
Received By: <u>ML</u>		Date Received: <u>6-11-16</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPM 0</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2 C</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>130461961</u> Secondary Temperature Device Serial # (if Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<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"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	If Preservation added, Lot#: <u>                    </u> Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7764 9768 3863 2 C</u> <u>3423 2 C</u>

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 23 June 2016**

<b>State</b>	<b>Certification</b>
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

# Semi-Volatile Analysis

# Case Narrative

GC/MS Semivolatile  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399218  
Work Order #: 399218

**Product:** Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry  
**Analytical Method:** SW846 3541/8270D SIM PAH  
**Analytical Procedure:** GL-OA-E-009 REV# 36  
**Analytical Batch:** 1575554

**Preparation Method:** SW846 3541  
**Preparation Procedure:** GL-OA-E-066 REV# 6  
**Preparation Batch:** 1575552

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399218001	B35YB7
1203569969	Method Blank (MB)
1203569970	Laboratory Control Sample (LCS)
1203569973	399585001(B35YC5) Matrix Spike (MS)
1203569974	399585001(B35YC5) 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.

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

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

Sample	Analyte	Value
1203569970 (LCS)	Benzo(a)pyrene	65* (70%-130%)
	Benzo(k)fluoranthene	58* (70%-130%)

**Miscellaneous Information**

**Manual Integrations**

Sample 399218001 (B35YB7) required manual integration to correctly position the baseline as set in the calibration standard injections.

**Certification Statement**

**June 24, 2016**

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: GEL399218 GEL Work Order: 399218

**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.

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: **23 JUN 2016**

Title: **Data Validator**

# Sample Data Summary

Semi-Volatile  
Certificate of Analysis  
Sample Summary

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SDG Number: GEL399218	Date Collected: 06/09/2016 13:30	Matrix: SOIL
Lab Sample ID: 399218001	Date Received: 06/11/2016 09:00	%Moisture: 3.4
Client ID: B35YB7	Client: CPRC001	Project: CPRC0F16043
Batch ID: 1575554	Method: SW846 3541/8270D SIM P.	SOP Ref: GL-OA-E-009
Run Date: 06/20/2016 19:53	Inst: MSD2.I	Dilution: 1
Prep Date: 06/20/2016 10:54	Analyst: AGS1	Inj. Vol: 1 uL
Data File: s062016.B\s2f2008.D	Aliquot: 30.02 g	Final Volume: 1 mL
	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
83-32-9	Acenaphthene	U	1.72	ug/kg	1.72	6.89
208-96-8	Acenaphthylene	U	1.72	ug/kg	1.72	6.89
120-12-7	Anthracene	U	1.72	ug/kg	1.72	6.89
56-55-3	Benzo(a)anthracene	U	1.72	ug/kg	1.72	6.89
50-32-8	Benzo(a)pyrene	U	1.72	ug/kg	1.72	6.89
205-99-2	Benzo(b)fluoranthene	U	1.72	ug/kg	1.72	6.89
191-24-2	Benzo(ghi)perylene	U	1.72	ug/kg	1.72	6.89
207-08-9	Benzo(k)fluoranthene	U	1.72	ug/kg	1.72	6.89
218-01-9	Chrysene	U	1.72	ug/kg	1.72	6.89
53-70-3	Dibenzo(a,h)anthracene	U	1.72	ug/kg	1.72	6.89
206-44-0	Fluoranthene	J	2.76	ug/kg	1.72	6.89
86-73-7	Fluorene	U	1.72	ug/kg	1.72	6.89
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.72	ug/kg	1.72	6.89
91-20-3	Naphthalene	U	1.03	ug/kg	1.03	6.89
85-01-8	Phenanthrene	J	2.76	ug/kg	1.72	6.89
129-00-0	Pyrene	J	1.72	ug/kg	1.72	6.89

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 23, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1575554										
QC1203569970	LCS										
Acenaphthene	333			254	ug/kg		76	(70%-130%)	AGS1	06/20/16	19:25
Acenaphthylene	333			260	ug/kg		78	(70%-130%)			
Anthracene	333			304	ug/kg		91	(70%-130%)			
Benzo(a)anthracene	333			249	ug/kg		75	(70%-130%)			
Benzo(a)pyrene	333			216	ug/kg		65 *	(70%-130%)			
Benzo(b)fluoranthene	333			269	ug/kg		81	(70%-130%)			
Benzo(ghi)perylene	333			267	ug/kg		80	(70%-130%)			
Benzo(k)fluoranthene	333			191	ug/kg		58 *	(70%-130%)			
Chrysene	333			281	ug/kg		84	(70%-130%)			
Dibenzo(a,h)anthracene	333			238	ug/kg		72	(70%-130%)			
Fluoranthene	333			285	ug/kg		86	(70%-130%)			
Fluorene	333			257	ug/kg		77	(70%-130%)			
Indeno(1,2,3-cd)pyrene	333			239	ug/kg		72	(70%-130%)			
Naphthalene	333			265	ug/kg		80	(70%-130%)			
Phenanthrene	333			277	ug/kg		83	(70%-130%)			
Pyrene	333			256	ug/kg		77	(70%-130%)			
**5-alpha-Androstane	167			147	ug/kg		88	(25%-129%)			
QC1203569969	MB										
Acenaphthene			U	1.67	ug/kg					06/20/16	18:56
Acenaphthylene			U	1.67	ug/kg						

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**QC Summary**

Workorder: 399218

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1575554										
Anthracene			U	1.67	ug/kg						
Benzo(a)anthracene			U	1.67	ug/kg				AGS1	06/20/16	18:56
Benzo(a)pyrene			U	1.67	ug/kg						
Benzo(b)fluoranthene			U	1.67	ug/kg						
Benzo(ghi)perylene			U	1.67	ug/kg						
Benzo(k)fluoranthene			U	1.67	ug/kg						
Chrysene			U	1.67	ug/kg						
Dibenzo(a,h)anthracene			U	1.67	ug/kg						
Fluoranthene			U	1.67	ug/kg						
Fluorene			U	1.67	ug/kg						
Indeno(1,2,3-cd)pyrene			U	1.67	ug/kg						
Naphthalene			U	0.999	ug/kg						
Phenanthrene			U	1.67	ug/kg						
Pyrene			U	1.67	ug/kg						
**5-alpha-Androstane	167			138	ug/kg		83	(25%-129%)			
QC1203569973 399585001 MS											
Acenaphthene	352	U	1.76	269	ug/kg		76	(18%-115%)		06/20/16	21:46
Acenaphthylene	352	U	1.76	325	ug/kg		92	(19%-116%)			
Anthracene	352	U	1.76	275	ug/kg		78	(23%-115%)			
Benzo(a)anthracene	352	U	1.76	263	ug/kg		75	(23%-124%)			
Benzo(a)pyrene	352	U	1.76	224	ug/kg		64	(20%-130%)			
Benzo(b)fluoranthene	352	U	1.76	219	ug/kg		62	(20%-134%)			
Benzo(ghi)perylene	352	U	1.76	237	ug/kg		67	(18%-118%)			

June 24, 2016

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QC Summary

Workorder: 399218

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatile-GC/MS											
Batch	1575554										
Benzo(k)fluoranthene	352	U	1.76	179	ug/kg		51	(23%-128%)	AGS1	06/20/16	21:46
Chrysene	352	U	1.76	278	ug/kg		79	(18%-121%)			
Dibenzo(a,h)anthracene	352	U	1.76	239	ug/kg		68	(12%-132%)			
Fluoranthene	352	U	1.76	210	ug/kg		60	(21%-124%)			
Fluorene	352	U	1.76	328	ug/kg		93	(21%-118%)			
Indeno(1,2,3-cd)pyrene	352	U	1.76	243	ug/kg		69	(11%-130%)			
Naphthalene	352	U	1.06	260	ug/kg		74	(14%-114%)			
Phenanthrene	352	J	2.11	275	ug/kg		78	(24%-106%)			
Pyrene	352	U	1.76	284	ug/kg		81	(16%-122%)			
**5-alpha-Androstane	176		152	122	ug/kg		69	(25%-129%)			
QC1203569974 399585001 MSD											
Acenaphthene	353	U	1.76	287	ug/kg	6	81	(0%-30%)		06/20/16	22:14
Acenaphthylene	353	U	1.76	287	ug/kg	12	81	(0%-30%)			
Anthracene	353	U	1.76	293	ug/kg	6	83	(0%-30%)			
Benzo(a)anthracene	353	U	1.76	273	ug/kg	4	77	(0%-30%)			
Benzo(a)pyrene	353	U	1.76	229	ug/kg	2	65	(0%-30%)			
Benzo(b)fluoranthene	353	U	1.76	226	ug/kg	3	64	(0%-30%)			
Benzo(ghi)perylene	353	U	1.76	216	ug/kg	9	61	(0%-30%)			
Benzo(k)fluoranthene	353	U	1.76	194	ug/kg	8	55	(0%-30%)			
Chrysene	353	U	1.76	287	ug/kg	3	81	(0%-30%)			
Dibenzo(a,h)anthracene	353	U	1.76	222	ug/kg	7	63	(0%-30%)			
Fluoranthene	353	U	1.76	242	ug/kg	14	69	(0%-30%)			

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**QC Summary**

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatile-GC/MS</b>											
Batch	1575554										
Fluorene	353	U	1.76	314	ug/kg	4	89	(0%-30%)	AGS1	06/20/16	22:14
Indeno(1,2,3-cd)pyrene	353	U	1.76	228	ug/kg	6	65	(0%-30%)			
Naphthalene	353	U	1.06	281	ug/kg	8	80	(0%-30%)			
Phenanthrene	353	J	2.11	289	ug/kg	5	81	(0%-30%)			
Pyrene	353	U	1.76	282	ug/kg	1	80	(0%-30%)			
*5-alpha-Androstane	176		152	108	ug/kg		61	(25%-129%)			

**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)

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: GEL399218

Matrix Type: SOLID

---

Sample ID	Client ID	5-alpha %REC
1203569969	MB for batch 1575552	83
1203569970	LCS for batch 1575552	88
399218001	B35YB7	88
1203569973	B35YC5MS	69
1203569974	B35YC5MSD	61

**Surrogate**

5-alpha- = 5-alpha-Androstane

**Acceptance Limits**

(25%-129%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# Flame Ionization Detector Analysis

# Case Narrative

**FID Flame Ionization Detector  
 Technical Case Narrative  
 CH2MHill Plateau Remediation Company (CPRC)  
 SDG #: GEL399218  
 Work Order #: 399218**

**Product:** Washington Method for the Determination of Extractable Petroleum Hydrocarbons

**Analytical Method:** WA EPH

**Analytical Procedure:** GL-OA-E-075 REV# 0

**Analytical Batches:** 1575485 and 1575484

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
399218001	B35YB7
1203569837	Method Blank (MB)
1203569838	Laboratory Control Sample (LCS)
1203569839	399481002(B35YC2) Matrix Spike (MS)
1203569840	399481002(B35YC2) 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.

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

Method blank 1203569837 (MB) contained a hit of Aliphatics Hydrocarbons C8-C10 just above the RDL. A similar concentration of Aliphatics Hydrocarbons C8-C10 was present in all client samples. The source of contamination was likely from impurities in one or more of the solvents used for the extractions and fractionations. Detects in samples were B qualified and should be considered as false positives.

**Matrix Spike (MS) Recovery Statement**

The MSD (See Below) recovery was not within the acceptance limits due to sample matrix interference. The MS and LCS recoveries were within acceptance limits. The data were reported.

Sample	Analyte	Value
1203569840 (B35YC2MSD)	Aromatic Hydrocarbons >C10-C12	64* (70%-130%)

**MS/MSD Relative Percent Difference (RPD) Statement**

The relative percent differences (RPD) between the MS and MSD (See Below) were not within the required acceptance limits. The MSD recovery was below acceptance limits, while the MS recovery passed. The LCS recovery also passed. The data were reported.

Sample	Analyte	Value
1203569839MS and 1203569840MSD (B35YC2)	Aromatic Hydrocarbons >C10-C12	26* (0%-20%)

The relative percent differences (RPD) between the MS and MSD (See Below) were not within the required acceptance limits. The individual recoveries in the MS and MSD were within acceptance limits. The data were reported.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203569839MS and 1203569840MSD (B35YC2)	Aromatic Hydrocarbons >C12-C16	26* (0%-20%)
	Aromatic Hydrocarbons >C16-C21	22* (0%-20%)

**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: GEL399218 GEL Work Order: 399218

**The Qualifiers in this report are defined as follows:**

- B The analyte was detected in both the associated QC blank and in the sample.
- 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.
- 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: Cameron Bearden

Date: 22 JUN 2016

Title: Group Leader

# Sample Data Summary

**Flame Ionization Detector  
Certificate of Analysis  
Sample Summary**

Page 1 of 2

SDG Number: GEL399218  
 Lab Sample ID: 399218001  
  
 Client ID: B35YB7  
 Batch ID: 1575485  
 Run Date: 06/21/2016 18:57  
 Prep Date: 06/20/2016 12:30  
 Data File: 062116\_WA\F5F2109.D

Date Collected: 06/09/2016 13:30  
 Date Received: 06/11/2016 09:00  
 Client: CPRC001  
 Method: WA EPH  
 Inst: FID5.I  
 Analyst: JMB3  
 Aliquot: 30.01 g  
 Column: DB-5ms

Matrix: SOIL  
 %Moisture: 3.4  
 Project: CPRC0F16043  
 SOP Ref: GL-OA-E-075  
 Dilution: 1  
 Inj. Vol: 1 uL  
 Final Volume: 2 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aromatic Hydrocarbons >C10-C12	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C12-C16	U	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C16-C21	U	690	ug/Kg	690	1380
	Aromatic Hydrocarbons >C21-C34	TU	690	ug/Kg	690	1380
	Aromatic Hydrocarbons C8-C10	U	690	ug/Kg	690	1380

**Flame Ionization Detector  
Certificate of Analysis  
Sample Summary**

Page 2 of 2

SDG Number: GEL399218  
Lab Sample ID: 399218001  
  
Client ID: B35YB7  
Batch ID: 1575485  
Run Date: 06/22/2016 00:30  
Prep Date: 06/20/2016 12:30  
Data File: 062116\_WA\F5F2120.D

Date Collected: 06/09/2016 13:30  
Date Received: 06/11/2016 09:00  
Client: CPRC001  
Method: WA EPH  
Inst: FID5.I  
Analyst: JMB3  
Aliquot: 30.01 g  
Column: DB-5ms

Matrix: SOIL  
%Moisture: 3.4  
Project: CPRC0F16043  
SOP Ref: GL-OA-E-075  
Dilution: 1  
Inj. Vol: 1 uL  
Final Volume: 2 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
	Aliphatic Hydrocarbons >C10-C12	U	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C12-C16	U	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C16-C21	U	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons >C21-C34	U	690	ug/Kg	690	1380
	Aliphatic Hydrocarbons C8-C10	BT	1570	ug/Kg	690	1380

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 22, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>GC-FID</b>											
Batch	1575485										
QC1203569838	LCS										
Aliphatic Hydrocarbons >C10-C12	6660			4770	ug/Kg		72	(70%-130%)	JMB3	06/21/16	23:59
Aliphatic Hydrocarbons >C12-C16	6660			5030	ug/Kg		75	(70%-130%)			
Aliphatic Hydrocarbons >C16-C21	6660			5100	ug/Kg		77	(70%-130%)			
Aliphatic Hydrocarbons C8-C10	6660		B	5820	ug/Kg		87	(70%-130%)			
Aromatic Hydrocarbons >C10-C12	6660			4900	ug/Kg		74	(70%-130%)		06/21/16	18:27
Aromatic Hydrocarbons >C12-C16	6660			5580	ug/Kg		84	(70%-130%)			
Aromatic Hydrocarbons >C16-C21	13300			10700	ug/Kg		81	(70%-130%)			
Aromatic Hydrocarbons >C21-C34	13300			9490	ug/Kg		71	(70%-130%)			
**1-Chlorooctadecane	1330			923	ug/Kg		69	(60%-140%)		06/21/16	23:59
**o-Terphenyl	1330			1060	ug/Kg		80	(60%-140%)		06/21/16	18:27
QC1203569837	MB										
Aliphatic Hydrocarbons >C10-C12			U	667	ug/Kg					06/21/16	23:29
Aliphatic Hydrocarbons >C12-C16			U	667	ug/Kg						
Aliphatic Hydrocarbons >C16-C21			U	667	ug/Kg						
Aliphatic Hydrocarbons >C21-C34			U	667	ug/Kg						
Aliphatic Hydrocarbons C8-C10				1810	ug/Kg						
Aromatic Hydrocarbons >C10-C12			U	667	ug/Kg					06/21/16	17:56
Aromatic Hydrocarbons >C12-C16			U	667	ug/Kg						
Aromatic Hydrocarbons >C16-C21			U	667	ug/Kg						
Aromatic Hydrocarbons >C21-C34			U	667	ug/Kg						

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QC Summary

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>GC-FID</b>											
Batch	1575485										
Aromatic Hydrocarbons C8-C10			U	667	ug/Kg						
**1-Chlorooctadecane	1330			1050	ug/Kg		79	(60%-140%)	JMB3	06/21/16	23:29
**o-Terphenyl	1330			1000	ug/Kg		75	(60%-140%)		06/21/16	17:56
QC1203569839 399481002 MS											
Aliphatic Hydrocarbons >C10-C12	6900	U	686	5380	ug/Kg		78	(70%-130%)		06/22/16	02:01
Aliphatic Hydrocarbons >C12-C16	6900	U	686	5590	ug/Kg		81	(70%-130%)			
Aliphatic Hydrocarbons >C16-C21	6900	U	686	5700	ug/Kg		83	(70%-130%)			
Aliphatic Hydrocarbons C8-C10	6900	BT	1570	B	6850	ug/Kg		76	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	6900	TU	686		5650	ug/Kg		82	(70%-130%)		06/21/16 20:28
Aromatic Hydrocarbons >C12-C16	6900	U	686		6450	ug/Kg		94	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	13800	U	686		12100	ug/Kg		88	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	13800	TU	686		10600	ug/Kg		77	(70%-130%)		
**1-Chlorooctadecane	1380		1010		1050	ug/Kg		76	(60%-140%)		06/22/16 02:01
**o-Terphenyl	1380		1080		1190	ug/Kg		86	(60%-140%)		06/21/16 20:28
QC1203569840 399481002 MSD											
Aliphatic Hydrocarbons >C10-C12	6850	U	686		4830	ug/Kg	11	70	(0%-20%)		06/22/16 02:31
Aliphatic Hydrocarbons >C12-C16	6850	U	686		4880	ug/Kg	14	71	(0%-20%)		
Aliphatic Hydrocarbons >C16-C21	6850	U	686		4950	ug/Kg	14	72	(0%-20%)		
Aliphatic Hydrocarbons C8-C10	6850	BT	1570	BT	6060	ug/Kg	12	66*	(0%-20%)		
Aromatic Hydrocarbons >C10-C12	6850	TU	686	T	4370	ug/Kg	26*	64*	(0%-20%)		06/21/16 20:58
Aromatic Hydrocarbons >C12-C16	6850	U	686		4990	ug/Kg	26*	73	(0%-20%)		
Aromatic Hydrocarbons >C16-C21	13700	U	686		9770	ug/Kg	22*	71	(0%-20%)		
Aromatic Hydrocarbons >C21-C34	13700	TU	686	T	8880	ug/Kg	18	65*	(0%-20%)		
**1-Chlorooctadecane	1370		1010		959	ug/Kg		70	(60%-140%)		06/22/16 02:31

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**QC Summary**

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
GC-FID											
Batch	1575485										
**o-Terphenyl	1370	1080		954	ug/Kg		70	(60%-140%)	JMB3	06/21/16	20:58

**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)

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.

Flame Ionization Detector  
Surrogate Recovery Report

SDG Number: GEL399218

Matrix Type: SOLID

Sample ID	Client ID	COD %REC	OTP %REC
1203569837	MB for batch 1575484		75
1203569838	LCS for batch 1575484		80
399218001	B35YB7		79
1203569839	B35YC2MS		86
1203569840	B35YC2MSD		70
1203569837	MB for batch 1575484	79	
1203569838	LCS for batch 1575484	69	
399218001	B35YB7	76	
1203569839	B35YC2MS	76	
1203569840	B35YC2MSD	70	

**Surrogate**

COD = 1-Chlorooctadecane

OTP = o-Terphenyl

**Acceptance Limits**

(60%-140%)

(60%-140%)

\* 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 #: GEL399218  
Work Order #: 399218**

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

**Analytical Method:** WTPH\_DIESEL

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

**Analytical Batch:** 1574929

**Preparation Method:** SW846 3541

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

**Preparation Batch:** 1574928

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399218001	B35YB7
1203568490	Method Blank (MB)
1203568491	Laboratory Control Sample (LCS)
1203568492	399360001(NonSDG) Matrix Spike (MS)
1203568493	399360001(NonSDG) 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.

**Miscellaneous Information**

**Manual Integrations**

Samples 1203568491 (LCS), 1203568492 (Non SDG 399360001MS) and 1203568493 (Non SDG 399360001MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

**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: GEL399218 GEL Work Order: 399218

**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.

DL Indicates that sample is diluted.

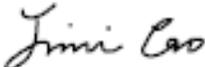
RA Indicates that sample is re-analyzed without re-extraction.

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: 23 JUN 2016

Title: Data Validator

# Sample Data Summary

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

Page 1 of 1

<b>SDG Number:</b> GEL399218	<b>Date Collected:</b> 06/09/2016 13:30	<b>Matrix:</b> SOIL
<b>Lab Sample ID:</b> 399218001	<b>Date Received:</b> 06/11/2016 09:00	<b>%Moisture:</b> 3.4
<b>Client ID:</b> B35YB7	<b>Client:</b> CPRC001	<b>Project:</b> CPRC0F16043
<b>Batch ID:</b> 1574929	<b>Method:</b> WTPH_DIESEL	<b>SOP Ref:</b> GL-OA-E-003
<b>Run Date:</b> 06/19/2016 18:08	<b>Inst:</b> FID7.I	<b>Dilution:</b> 1
<b>Prep Date:</b> 06/16/2016 11:28	<b>Analyst:</b> JMB3	<b>Inj. Vol:</b> 1 uL
<b>Data File:</b> 061916DRO-MO\F7F1916.D	<b>Aliquot:</b> 30.01 g	<b>Final Volume:</b> 1 mL
	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	U	2240	ug/kg	2240	6900
	Motor Oil	J	4680	ug/kg	2240	6900

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 22, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Diesel Range Organics</b>											
Batch	1574929										
QC1203568491	LCS										
Diesel Range Organics	66600			53500	ug/kg		80	(70%-130%)	JMB3	06/19/16	17:29
Motor Oil	66600			57900	ug/kg		87	(70%-130%)			
**o-Terphenyl	666			479	ug/kg		72	(60%-140%)			
QC1203568490	MB										
Diesel Range Organics			U	2160	ug/kg					06/19/16	16:51
Motor Oil			U	2160	ug/kg						
**o-Terphenyl	666			410	ug/kg		62	(60%-140%)			
QC1203568492	399360001 MS										
Diesel Range Organics	72200	27700		82900	ug/kg		76	(70%-130%)		06/19/16	19:25
Motor Oil	72200	10200		73600	ug/kg		88	(70%-130%)			
**o-Terphenyl	722	501		558	ug/kg		77	(60%-140%)			
QC1203568493	399360001 MSD										
Diesel Range Organics	72200	27700		79100	ug/kg	5	71	(0%-20%)		06/19/16	20:03
Motor Oil	72200	10200		79000	ug/kg	7	95	(0%-20%)			
**o-Terphenyl	722	501		581	ug/kg		80	(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

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399218

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

FID Diesel Range Organics  
Surrogate Recovery Report

SDG Number: GEL399218

Matrix Type: SOLID

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Sample ID	Client ID	OTP %REC
1203568490	MB for batch 1574928	62
1203568491	LCS for batch 1574928	72
399218001	B35YB7	61
1203568492	B35YH8MS	77
1203568493	B35YH8MSD	80

**Surrogate**

OTP = o-Terphenyl

**Acceptance Limits**

(60%-140%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

# General Chem Analysis

# Case Narrative

General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL399218  
Work Order #: 399218

**Product:** pH

**Analytical Method:** SW846 9045D

**Analytical Procedure:** GL-GC-E-008 REV# 21

**Analytical Batch:** 1573817

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399218001	B35YB7
1203565524	Laboratory Control Sample (LCS)
1203565526	398860001(B35VN3) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" 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 Times**

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

<b>Sample</b>	<b>Analyte</b>	<b>Value</b>
1203565526 (B35VN3DUP)	pH	Received 08-JUN-16, out of holding 07-JUN-16
399218001 (B35YB7)	pH	Received 11-JUN-16, out of holding 09-JUN-16

**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: GEL399218 GEL Work Order: 399218

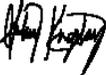
**The Qualifiers in this report are defined as follows:**

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: Aubrey Kingsbury

Date: 20 JUN 2016

Title: Analyst I

# Sample Data Summary

June 24, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 20, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF F16-043

Client Sample ID: B35YB7 Project: CPRC0F16043
Sample ID: 399218001 Client ID: CPRC001
Matrix: SOIL
Collect Date: 09-JUN-16 13:30
Receive Date: 11-JUN-16
Collector: Client
Moisture: 3.35%

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Row 1: 9045\_pH (Non-Aqueous):COMMON "As Received", X, 8.91, 0.010, 0.100, SU, 1, RXB5, 06/15/16, 1828, 1573817, 1.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9045D, (empty).

Notes:

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: June 20, 2016

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1573817										
QC1203565526	398860001	DUP									
pH	X	7.96	X	8.02	SU	0.751		(0%-30%)	RXB5	06/15/16	18:19
QC1203565524	LCS										
pH	7.00			7.00	SU		100	(70%-130%)		06/15/16	18:15

**Notes:**

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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  $\geq$  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.
- N Spike 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

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  
CH2M Hill Plateau Remediation Company (CPRC)  
SDG #: GEL399218  
Work Order #: 399218**

**Product: Dry Weight**

**Analytical Method:** ASTM D 2216 (Modified)

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

**Analytical Batch:** 1574107

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
399218001	B35YB7
1203566324	399224001(NonSDG) 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.

**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: GEL399218 GEL Work Order: 399218

**The Qualifiers in this report are defined as follows:**

**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:** Kate Gellatly

**Date:** 17 JUN 2016

**Title:** Analyst I

# Sample Data Summary

**Rad**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: GEL399218	Client: CPRC001	Project: CPRC0F16043
Lab Sample ID: 399218001	Date Collected: 06/09/2016 13:30	Matrix: SOIL
	Date Received: 06/11/2016 09:00	%Moisture: 3.4
Client ID: B35YB7		Prep Basis: "As Received"
Batch ID: 1574107	Method: ASTM D 2216 (Modified)	SOP Ref: GL-OA-E-020
Run Date: 06/14/2016 09:26	Analyst: CXC1	Instrument: SP-39020004
Data File:		Count Time:
Prep Batch: 1574107		
Prep Date: 06/14/2016 09:26		

CAS No.	Parmname	Qual	Result	Units	MDC		
	Moisture		3.35	percent	+/-		
<b>Surrogate/Tracer recovery</b>		<b>Result</b>	<b>Nominal</b>	<b>Units</b>	<b>Recovery%</b>	<b>Acceptable Limits</b>	

**Comments:**

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).  
 The MDC is a sample specific MDC.

# Quality Control Summary

June 24, 2016

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: June 17, 2016

Page 1 of 2

Client : CH2M Hill Plateau Remediation Company  
 MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 399218

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Gravimetric Solids</b>										
Batch	1574107									
QC1203566324	399224001	DUP								
Moisture		21.6		21.2	percent	RPD: 2	(0%-20%)	CXC1	06/14/1609:26	

### Notes:

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

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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
- 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.
- UX Gamma Spectroscopy--Uncertain identification
- 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)

June 24, 2016

GEL LABORATORIES LLC

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

QC Summary

Workorder: 399218

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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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.