

July 25, 2016



a member of **The GEL Group** INC



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July 25, 2016

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

Re: CHPRC SAF X16-037  
Work Order: 400183  
SDG: GEL400183

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 28, 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: 300071 - 7H  
Chain of Custody: X16-037-063  
Enclosures



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# Case Narrative

General Narrative  
for  
CH2MHill Plateau Remediation Company  
CHPRC SAF X16-037  
SDG: GEL400183

July 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 June 28, 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. There are no additional comments concerning sample receipt.

**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:

<b>Laboratory Identification</b>	<b>Sample Description</b>
400183001	B35M16
400183002	B35M19

**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: GC/MS Volatile, General Chemistry, 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.

**July 25, 2016**

*B. Luthman*  
Brielle Luthman for  
Heather Shaffer  
Project Manager

Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL400183  
Work Order #: 400183

**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**

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203576190 (B35M16PS)	2-Butanone	64* (70%-130%)
	Acetone	50* (70%-130%)
1203576191 (B35M16PSD)	2-Butanone	66* (70%-130%)
	Acetone	52* (70%-130%)

**Metals**

**Determination of Metals by ICP**

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.

**Calibration Information**

**CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 400183001 (B35M16) and 400183002 (B35M19).

**Quality Control (QC) Information**

**Matrix Spike (MS/MSD) Recovery Statement**

The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits.

This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203575907 (B35M16MS)	Sodium	57.7* (75%-125%)

**Post Spike (PS) Recovery Statement**

The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203580616 (B35M16PS)	Sodium	76.5* (80%-120%)

**Serial Dilution % Difference Statement**

Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203575909 (B35M16SDILT)	Sodium	15.8 *(0%-10%)

**General Chemistry**

**Alkalinity**

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.

**Radiochemistry**

**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 400183001 (B35M16) was verified by recounting at least five days from the separation date. The recount is reported.

**C14\_LSC: 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 400183001 (B35M16) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**TRITIUM\_DIST\_LSC: 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 400183001 (B35M16) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**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**  
 C.O.C.# **X16-037-063**  
 Page 1 of 1

**Collector:** Juan Aguilera c1424  
**SAF No.:** X16-037  
**Project Title:** 100-KW Rebound Study, May 31, 2016  
**Shipped To (Lab):** GEL Laboratories, LLC  
**Protocol:** CERCLA

**Contact/Requester:** Karen Waters-Husted  
**Sampling Origin:** Hanford Site  
**Logbook No.:** HNF-N-506 85 / 82  
**Method of Shipment:** Commercial Carrier  
**Priority:** 30 Days **PRIORITY**

**Telephone No.:** 509-376-4650  
**Purchase Order/Charge Code:** 304027  
**Ice Chest No.:** 6005-492  
**Bill of Lading/Air Bill No.:** 77666 14089939  
**Offsite Property No.:** 6776

**SPECIAL INSTRUCTIONS:** Hold Time  
 N/A  
 Special Handling: N/A

**Preservative:** Total Activity Exemption: Yes  No

**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

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35M16	N	W JUN 27 2016	0934	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35M16	N	W		1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B35M16	N	W		4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B35M16	N	W		1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B35M16	N	W		3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35M16	N	W		1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B35M19	Y	W JUN 27 2016	0934	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

Relinquished By: <b>C1424 Juan Aguilera</b>	Date/Time: JUN 27 2016 1015	Received By: <b>Leah West FSR/PRC</b>	Date/Time: JUN 27 2016 1015	Print: <i>Leah West</i>	Sign: <i>Leah West</i>
Relinquished By: <b>Leah West FSR/PRC</b>	Date/Time: JUN 27 2016 1400	Received By: <b>FEDEX</b>	Date/Time:	Print: <b>FEDEX</b>	Sign:
Relinquished By: <b>Fed Ex</b>	Date/Time:	Received By: <b>M. Kusow mlk@hwr</b>	Date/Time: 6-28-16 0920	Print: <i>M. Kusow</i>	Sign: <i>M. Kusow</i>
Relinquished By:	Date/Time:	Received By:	Date/Time:	Print:	Sign:

**Matrix \***

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

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>OPRE MK</u>		SDG/AR/COC/Work Order:	
Received By:		Date Received: <u>6-28-16</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>Opno</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?			

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: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2c</u>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>13082261</u> 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:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>			If Preservation added, Lot#: Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>			(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
16 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7766 1135 4885 2c</u> <u>7766 1408 9939 2c</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 >= 2X the MDA and, after corrections, result is >= 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 >= 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 >= 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 July 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 #: GEL400183  
Work Order #: 400183

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

**Analytical Method:** SW846 8260C

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

**Analytical Batch:** 1578083

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400183001	B35M16
1203576188	Method Blank (MB)
1203576189	Laboratory Control Sample (LCS)
1203576190	400183001(B35M16) Post Spike (PS)
1203576191	400183001(B35M16) Post Spike Duplicate (PSD)

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.

**Quality Control (QC) Information**

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203576190 (B35M16PS)	2-Butanone	64* (70%-130%)
	Acetone	50* (70%-130%)
1203576191 (B35M16PSD)	2-Butanone	66* (70%-130%)
	Acetone	52* (70%-130%)

**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: GEL400183 GEL Work Order: 400183

**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

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.

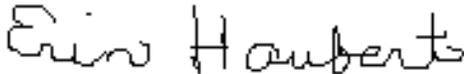
RA Indicates that sample is re-analyzed without re-extraction.

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: Erin Haubert

Date: 22 JUL 2016

Title: Data Validator

# Sample Data Summary

Volatile  
Certificate of Analysis  
Sample Summary

Page 1 of 1

SDG Number: GEL400183	Date Collected: 06/27/2016 09:34	Matrix: WATER
Lab Sample ID: 400183001	Date Received: 06/28/2016 09:00	
Client ID: B35M16	Client: CPRC001	Project: CPRC0X16037
Batch ID: 1578083	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/29/2016 10:05	Inst: VOA3.I	Dilution: 1
Prep Date: 06/29/2016 10:05	Analyst: CDS1	Purge Vol: 5 mL
Data File: 062916V3\3P307.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.370	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	4.67	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

# Quality Control Summary

July 25, 2016

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: July 1, 2016

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CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400183

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1578083										
QC1203576189	LCS										
1,1,1-Trichloroethane	50.0			58.1	ug/L		116	(70%-130%)	CDS1	06/29/16	08:03
1,1,2-Trichloroethane	50.0			49.1	ug/L		98	(70%-130%)			
1,1-Dichloroethane	50.0			54.3	ug/L		109	(70%-130%)			
1,1-Dichloroethylene	50.0			57.2	ug/L		114	(70%-130%)			
1,2-Dichloroethane	50.0			48.7	ug/L		97	(70%-130%)			
2-Butanone	250			259	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250			216	ug/L		86	(70%-130%)			
Acetone	250			251	ug/L		100	(70%-130%)			
Benzene	50.0			54.6	ug/L		109	(70%-130%)			
Carbon disulfide	250			271	ug/L		109	(70%-130%)			
Carbon tetrachloride	50.0			55.9	ug/L		112	(70%-130%)			
Chlorobenzene	50.0			52.8	ug/L		106	(70%-130%)			
Chloroform	50.0			53.3	ug/L		107	(70%-130%)			
Ethylbenzene	50.0			52.1	ug/L		104	(70%-130%)			
Methylene chloride	50.0			54.4	ug/L		109	(70%-130%)			
Tetrachloroethylene	50.0			53.5	ug/L		107	(70%-130%)			
Toluene	50.0			51.1	ug/L		102	(70%-130%)			
Trichloroethylene	50.0			54.9	ug/L		110	(70%-130%)			
Vinyl chloride	50.0			45.4	ug/L		91	(70%-130%)			
Xylenes (total)	150			155	ug/L		103	(70%-130%)			

July 25, 2016

### GEL LABORATORIES LLC

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

## QC Summary

Workorder: 400183

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1578083										
**1,2-Dichloroethane-d4	50.0			46.3	ug/L		93	(70%-130%)	CDS1	06/29/16	08:03
**Bromofluorobenzene	50.0			50.4	ug/L		101	(70%-130%)			
**Toluene-d8	50.0			46.3	ug/L		93	(70%-130%)			
QC1203576188	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/29/16	09:04
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1578083										
Vinyl chloride			U	0.300	ug/L				CDS1	06/29/16	09:04
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			51.1	ug/L		102	(70%-130%)			
**Bromofluorobenzene	50.0			48.6	ug/L		97	(70%-130%)			
**Toluene-d8	50.0			50.9	ug/L		102	(70%-130%)			
QC1203576190 400183001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	54.7	ug/L		109	(70%-130%)		06/29/16	16:09
1,1,2-Trichloroethane	50.0	U	0.00	48.9	ug/L		98	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	52.3	ug/L		105	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	49.9	ug/L		100	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	47.0	ug/L		94	(70%-130%)			
2-Butanone	250	TU	0.00 T	160	ug/L		64*	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	215	ug/L		86	(70%-130%)			
Acetone	250	TU	0.00 T	124	ug/L		50*	(70%-130%)			
Benzene	50.0	U	0.00	51.2	ug/L		102	(70%-130%)			
Carbon disulfide	250	U	0.00	248	ug/L		99	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	52.5	ug/L		105	(70%-130%)			
Chlorobenzene	50.0	U	0.00	50.4	ug/L		101	(70%-130%)			
Chloroform	50.0	J	0.370	51.5	ug/L		102	(70%-130%)			
Ethylbenzene	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
Methylene chloride	50.0	U	0.00	51.5	ug/L		103	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1578083										
Toluene	50.0	U	0.00	51.7	ug/L		103	(70%-130%)	CDS1	06/29/16	16:09
Trichloroethylene	50.0	J	4.67	55.4	ug/L		101	(70%-130%)			
Vinyl chloride	50.0	U	0.00	40.8	ug/L		82	(70%-130%)			
Xylenes (total)	150	U	0.00	149	ug/L		100	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		52.7	47.6	ug/L		95	(70%-130%)			
**Bromofluorobenzene	50.0		46.9	50.3	ug/L		101	(70%-130%)			
**Toluene-d8	50.0		50.1	49.2	ug/L		98	(70%-130%)			
QC1203576191 400183001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	56.0	ug/L	2	112	(0%-20%)		06/29/16	16:39
1,1,2-Trichloroethane	50.0	U	0.00	46.7	ug/L	4	93	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	51.8	ug/L	1	104	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	52.8	ug/L	6	106	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	48.0	ug/L	2	96	(0%-20%)			
2-Butanone	250	TU	0.00	T 166	ug/L	3	66*	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	212	ug/L	1	85	(0%-20%)			
Acetone	250	TU	0.00	T 130	ug/L	5	52*	(0%-20%)			
Benzene	50.0	U	0.00	52.0	ug/L	2	104	(0%-20%)			
Carbon disulfide	250	U	0.00	251	ug/L	1	100	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	51.8	ug/L	1	104	(0%-20%)			
Chlorobenzene	50.0	U	0.00	48.8	ug/L	3	98	(0%-20%)			
Chloroform	50.0	J	0.370	49.9	ug/L	3	99	(0%-20%)			
Ethylbenzene	50.0	U	0.00	49.3	ug/L	3	99	(0%-20%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Volatile-GC/MS</b>											
Batch	1578083										
Methylene chloride	50.0	U	0.00	50.4	ug/L	2	101	(0%-20%)	CDS1	06/29/16	16:39
Tetrachloroethylene	50.0	U	0.00	49.1	ug/L	3	98	(0%-20%)			
Toluene	50.0	U	0.00	47.9	ug/L	8	96	(0%-20%)			
Trichloroethylene	50.0	J	4.67	54.6	ug/L	1	100	(0%-20%)			
Vinyl chloride	50.0	U	0.00	42.8	ug/L	5	86	(0%-20%)			
Xylenes (total)	150	U	0.00	144	ug/L	4	96	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		52.7	49.8	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0		46.9	50.6	ug/L		101	(70%-130%)			
**Toluene-d8	50.0		50.1	48.5	ug/L		97	(70%-130%)			

**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)

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### QC Summary

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<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
-----------------	------------	---------------	-------------	-----------	--------------	-------------	-------------	--------------	--------------	-------------	-------------

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.

Volatile  
Surrogate Recovery Report

SDG Number: GEL400183

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203576189	LCS for batch 1578083	93	93	101
1203576188	MB for batch 1578083	102	102	97
400183001	B35M16	105	100	94
1203576190	B35M16PS	95	98	101
1203576191	B35M16PSD	100	97	101

**Surrogate**

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

**Acceptance Limits**

(70%-130%)

(70%-130%)

(70%-130%)

\* 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 #: GEL400183  
Work Order #: 400183

**Product: Determination of Metals by ICP**

**Analytical Method:** 6010\_METALS\_ICP

**Analytical Procedure:** GL-MA-E-013 REV# 26

**Analytical Batch:** 1577901

**Preparation Method:** SW846 3005A

**Preparation Procedure:** GL-MA-E-006 REV# 13

**Preparation Batch:** 1577899

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400183001	B35M16
400183002	B35M19
1203575905	Method Blank (MB)ICP
1203575906	Laboratory Control Sample (LCS)
1203575909	400183001(B35M16L) Serial Dilution (SD)
1203575907	400183001(B35M16S) Matrix Spike (MS)
1203575908	400183001(B35M16SD) Matrix Spike Duplicate (MSD)
1203580616	400183001(B35M16PS) Post Spike (PS)

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.

**Calibration Information**

**CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 400183001 (B35M16) and 400183002 (B35M19).

**Quality Control (QC) Information**

**Matrix Spike (MS/MSD) Recovery Statement**

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203575907 (B35M16MS)	Sodium	57.7* (75%-125%)

**Post Spike (PS) Recovery Statement**

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the presence of matrix interferences.

Sample	Analyte	Value
1203580616 (B35M16PS)	Sodium	76.5* (80%-120%)

**Serial Dilution % Difference Statement**

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Sample	Analyte	Value
1203575909 (B35M16SDILT)	Sodium	15.8 *(0%-10%)

**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: GEL400183 GEL Work Order: 400183

**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.
- M Duplicate precision not met.
- 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.

**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: 25 JUL 2016**

**Title: Data Validator**

# Sample Data Summary

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** GEL400183

**CONTRACT:** CPRC0X16037

**METHOD TYPE:** SW846

**SAMPLE ID:**400183001

**BASIS:** As Received

**DATE COLLECTED** 27-JUN-16

**CLIENT ID:** B35M16

**LEVEL:** Low

**DATE RECEIVED** 28-JUN-16

**MATRIX:** WATER

**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-39-3	Barium	35.7	ug/L		1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-70-2	Calcium	60400	ug/L		50	200	200	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-47-3	Chromium	8.79	ug/L		1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7439-95-4	Magnesium	12100	ug/L		110	300	300	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-02-0	Nickel	2.22	ug/L	B	1.5	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-09-7	Potassium	4360	ug/L		50	150	150	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-23-5	Sodium	16900	ug/L	MN	100	300	300	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-62-2	Vanadium	5.73	ug/L		1	5	5	1	P	HSC	07/05/16 15:37	070516A-2	1577901
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/05/16 15:37	070516A-2	1577901

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577901	1577899	SW846 3005A	50	mL	50	mL	06/28/16	JP1

**\*Analytical Methods:**

P SW846 3005A/6010C

**METALS**  
-1-  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** GEL400183

**CONTRACT:** CPRC0X16037

**METHOD TYPE:** SW846

**SAMPLE ID:**400183002

**BASIS:** Filtered

**DATE COLLECTED** 27-JUN-16

**CLIENT ID:** B35M19

**LEVEL:** Low

**DATE RECEIVED** 28-JUN-16

**MATRIX:** WATER

**Dissolved Metals**

**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-36-0	Antimony	3.5	ug/L	U	3.5	10	10	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-38-2	Arsenic	5	ug/L	U	5	30	30	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-39-3	Barium	34.7	ug/L		1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-43-9	Cadmium	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-70-2	Calcium	59500	ug/L		50	200	200	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-47-3	Chromium	7.95	ug/L		1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7439-95-4	Magnesium	11900	ug/L		110	300	300	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-02-0	Nickel	1.93	ug/L	B	1.5	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-09-7	Potassium	4200	ug/L		50	150	150	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-22-4	Silver	1	ug/L	U	1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-23-5	Sodium	16300	ug/L	MN	100	300	300	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-62-2	Vanadium	5.39	ug/L		1	5	5	1	P	HSC	07/05/16 15:51	070516A-2	1577901
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	07/05/16 15:51	070516A-2	1577901

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1577901	1577899	SW846 3005A	50	mL	50	mL	06/28/16	JP1

**\*Analytical Methods:**

P SW846 3005A/6010C

# Quality Control Summary

July 25, 2016

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: July 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: 400183

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577901										
QC1203575906	LCS										
Antimony	500			479	ug/L		95.9	(80%-120%)	HSC	07/05/16	15:34
Arsenic	500			458	ug/L		91.5	(80%-120%)			
Barium	500			473	ug/L		94.6	(80%-120%)			
Cadmium	500			469	ug/L		93.7	(80%-120%)			
Calcium	5000			4940	ug/L		98.8	(80%-120%)			
Chromium	500			466	ug/L		93.2	(80%-120%)			
Cobalt	500			474	ug/L		94.8	(80%-120%)			
Copper	500			473	ug/L		94.6	(80%-120%)			
Iron	5000			4990	ug/L		99.8	(80%-120%)			
Magnesium	5000			4960	ug/L		99.2	(80%-120%)			
Manganese	500			468	ug/L		93.6	(80%-120%)			
Nickel	500			478	ug/L		95.6	(80%-120%)			
Potassium	5000			4830	ug/L		96.6	(80%-120%)			
Silver	500			466	ug/L		93.2	(80%-120%)			
Sodium	5000			4710	ug/L		94.1	(80%-120%)			
Vanadium	500			476	ug/L		95.2	(80%-120%)			
Zinc	500			455	ug/L		90.9	(80%-120%)			
QC1203575905	MB										
Antimony			U	3.50	ug/L					07/05/16	15:30
Arsenic			U	5.00	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577901										
Barium			U	1.00	ug/L						
Cadmium			U	1.00	ug/L				HSC	07/05/16	15:30
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Potassium			U	50.0	ug/L						
Silver			U	1.00	ug/L						
Sodium			U	100	ug/L						
Vanadium			U	1.00	ug/L						
Zinc			U	3.30	ug/L						
QC1203575907 400183001 MS											
Antimony	500	U	3.50	485	ug/L		96.6	(75%-125%)		07/05/16	15:40
Arsenic	500	U	5.00	464	ug/L		92.8	(75%-125%)			
Barium	500		35.7	496	ug/L		92.1	(75%-125%)			
Cadmium	500	U	1.00	453	ug/L		90.5	(75%-125%)			
Calcium	5000		60400	63000	ug/L		N/A	(75%-125%)			
Chromium	500		8.79	461	ug/L		90.4	(75%-125%)			
Cobalt	500	U	1.00	446	ug/L		89.1	(75%-125%)			

July 25, 2016

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## QC Summary

Workorder: 400183

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577901										
Copper	500	U	3.00		469	ug/L	93.8	(75%-125%)	HSC	07/05/16	15:40
Iron	5000	U	30.0		4760	ug/L	95	(75%-125%)			
Magnesium	5000		12100		16200	ug/L	82.4	(75%-125%)			
Manganese	500	U	2.00		453	ug/L	90.4	(75%-125%)			
Nickel	500	B	2.22		446	ug/L	88.7	(75%-125%)			
Potassium	5000		4360		9210	ug/L	97	(75%-125%)			
Silver	500	U	1.00		458	ug/L	91.6	(75%-125%)			
Sodium	5000	MN	16900	N	19700	ug/L	57.7*	(75%-125%)			
Vanadium	500		5.73		480	ug/L	94.9	(75%-125%)			
Zinc	500	U	3.30		443	ug/L	88.5	(75%-125%)			
QC1203575908 400183001 MSD											
Antimony	500	U	3.50		482	ug/L	0.625	96	(0%-20%)	07/05/16	15:44
Arsenic	500	U	5.00		464	ug/L	0.162	92.6	(0%-20%)		
Barium	500		35.7		493	ug/L	0.59	91.5	(0%-20%)		
Cadmium	500	U	1.00		451	ug/L	0.409	90.1	(0%-20%)		
Calcium	5000		60400		62300	ug/L	1.05	N/A	(0%-20%)		
Chromium	500		8.79		459	ug/L	0.363	90.1	(0%-20%)		
Cobalt	500	U	1.00		444	ug/L	0.245	88.9	(0%-20%)		
Copper	500	U	3.00		468	ug/L	0.228	93.6	(0%-20%)		
Iron	5000	U	30.0		4830	ug/L	1.43	96.4	(0%-20%)		
Magnesium	5000		12100		16200	ug/L	0.315	83.4	(0%-20%)		
Manganese	500	U	2.00		444	ug/L	1.95	88.7	(0%-20%)		

July 25, 2016

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## QC Summary

Workorder: 400183

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577901										
Nickel	500	B	2.22	444	ug/L	0.373	88.3	(0%-20%)	HSC	07/05/16	15:44
Potassium	5000		4360	8900	ug/L	3.39	90.9	(0%-20%)			
Silver	500	U	1.00	458	ug/L	0.0415	91.5	(0%-20%)			
Sodium	5000	MN	16900	20900	ug/L	5.89	81.7	(0%-20%)			
Vanadium	500		5.73	479	ug/L	0.204	94.7	(0%-20%)			
Zinc	500	U	3.30	441	ug/L	0.416	88.1	(0%-20%)			
QC1203580616	400183001	PS									
Sodium	5000	MN	16900	20700	ug/L		76.5 *	(80%-120%)		07/08/16	14:16
QC1203575909	400183001	SDILT									
Antimony		U	1.89	DU	17.5	ug/L	N/A	(0%-10%)		07/05/16	15:47
Arsenic		U	0.408	DU	25.0	ug/L	N/A	(0%-10%)			
Barium			35.7	D	6.64	ug/L	6.88	(0%-10%)			
Cadmium		U	0.296	DU	5.00	ug/L	N/A	(0%-10%)			
Calcium			60400	D	11800	ug/L	2.56	(0%-10%)			
Chromium			8.79	BD	1.67	ug/L	5.02	(0%-10%)			
Cobalt		U	-0.377	DU	5.00	ug/L	N/A	(0%-10%)			
Copper		U	-0.155	DU	15.0	ug/L	N/A	(0%-10%)			
Iron		U	12.9	DU	150	ug/L	N/A	(0%-10%)			
Magnesium			12100	D	2350	ug/L	2.54	(0%-10%)			
Manganese		U	0.451	DU	10.0	ug/L	N/A	(0%-10%)			
Nickel		B	2.22	DU	7.50	ug/L	N/A	(0%-10%)			
Potassium			4360	D	791	ug/L	9.14	(0%-10%)			
Silver		U	-1.1	DU	5.00	ug/L	N/A	(0%-10%)			

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**QC Summary**

Workorder: 400183

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1577901										
Sodium	MN	16900	DM	2840	ug/L	15.8*		(0%-10%)	HSC	07/05/16	15:47
Vanadium		5.73	BD	1.23	ug/L	7.3		(0%-10%)			
Zinc	U	0.376	DU	16.5	ug/L	N/A		(0%-10%)			

**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.
- 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.

# General Chem Analysis

# Case Narrative

General Chemistry  
Technical Case Narrative  
CH2MHill Plateau Remediation Company (CPRC)  
SDG #: GEL400183  
Work Order #: 400183

**Product:** Alkalinity

**Analytical Method:** 2320\_ALKALINITY

**Analytical Procedure:** GL-GC-E-033 REV# 12

**Analytical Batch:** 1577877

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>
400183001	B35M16
1203575846	Method Blank (MB)
1203575847	Laboratory Control Sample (LCS)
1203575850	400183001(B35M16) 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: GEL400183 GEL Work Order: 400183

**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.

**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: 12 JUL 2016

Title: Analyst I

# Sample Data Summary

July 25, 2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 12, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X16-037

Client Sample ID: B35M16
Sample ID: 400183001
Matrix: WATER
Collect Date: 27-JUN-16 09:34
Receive Date: 28-JUN-16
Collector: Client
Project: CPRC0X16037
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, DF, Analyst, Date, Time Batch, Method. Rows include Titration and Ion Analysis and Alkalinity data.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 2320\_ALKALINITY.

Notes:

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: July 12, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400183

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1577877										
QC1203575850	400183001	DUP									
Alkalinity, Total as CaCO3		123000		123000	ug/L	0		(0%-20%)	RXB5	06/28/16	16:53
Bicarbonate alkalinity (CaCO3)		123000		123000	ug/L	0		(0%-20%)			
Carbonate alkalinity (CaCO3)	U	725	U	725	ug/L	N/A					
Hydroxide alkalinity as CaCO3	U	725	U	725	ug/L	N/A					
QC1203575847	LCS										
Alkalinity, Total as CaCO3	50000			53000	ug/L		106	(80%-120%)		06/28/16	16:37
QC1203575846	MB										
Alkalinity, Total as CaCO3			U	725	ug/L					06/28/16	16:02
Bicarbonate alkalinity (CaCO3)			U	725	ug/L						
Carbonate alkalinity (CaCO3)			U	725	ug/L						
Hydroxide alkalinity as CaCO3			U	725	ug/L						

**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 >= 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

July 25, 2016

## GEL LABORATORIES LLC

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

### QC Summary

Workorder: 400183

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<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
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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.

^ 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 #: GEL400183  
Work Order #: 400183

**Product:** SRISO\_SEP\_PRECIP\_GPC: COMMON

**Analytical Method:** SRISO\_SEP\_PRECIP\_GPC

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

**Analytical Batch:** 1579220

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>
400183001	B35M16
1203579106	Method Blank (MB)
1203579107	400141005(B35ML6) Sample Duplicate (DUP)
1203579108	Laboratory Control Sample (LCS)

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**

**Recounts**

Sample 400183001 (B35M16) was verified by recounting at least five days from the separation date. The recount is reported.

**Product:** C14\_LSC: COMMON

**Analytical Method:** C14\_LSC

**Analytical Procedure:** GL-RAD-A-003 REV# 15

**Analytical Batch:** 1578295

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>
400183001	B35M16
1203576766	Method Blank (MB)
1203576767	400025001(B35M74) Sample Duplicate (DUP)
1203576768	400025001(B35M74) Matrix Spike (MS)
1203576769	Laboratory Control Sample (LCS)

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**

**Recounts**

Sample 400183001 (B35M16) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**Product:** TRITIUM\_DIST\_LSC: COMMON

**Analytical Method:** TRITIUM\_DIST\_LSC

**Analytical Procedure:** GL-RAD-A-002 REV# 21

**Analytical Batch:** 1579141

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>
400183001	B35M16
1203578832	Method Blank (MB)
1203578833	400025001(B35M74) Sample Duplicate (DUP)
1203578834	400025001(B35M74) Matrix Spike (MS)
1203578835	Laboratory Control Sample (LCS)

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**

**Recounts**

Sample 400183001 (B35M16) was recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

**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: GEL400183 GEL Work Order: 400183

**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.

**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:** Theresa Austin

**Date:** 20 JUL 2016

**Title:** Group Leader

# Sample Data Summary

Rad  
 Certificate of Analysis  
 Sample Summary

SDG Number: GEL400183	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400183001	Date Collected: 06/27/2016 09:34	Matrix: WATER
	Date Received: 06/28/2016 09:20	
Client ID: B35M16	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579220	Analyst: BXF1	SOP Ref: GL-RAD-A-004
Run Date: 07/18/2016 12:24	Aliquot: 300 mL	Instrument: PIC13D
Data File: S1579220r1.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579220		
Prep Date: 07/12/2016 14:13		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		16.0	pCi/L	+/-1.76	3.09	0.901	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	5.60	7.37	mg	76	(40%-110%)

Comments:

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: GEL400183	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400183001	Date Collected: 06/27/2016 09:34	Matrix: WATER
	Date Received: 06/28/2016 09:20	
Client ID: B35M16	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1578295	Analyst: TXJ1	SOP Ref: GL-RAD-A-003
Run Date: 07/14/2016 21:06	Aliquot: 60 mL	Instrument: LSCBLUE
Data File: C1578295.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1578295		
Prep Date: 07/14/2016 09:05		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		616	pCi/L	+/-30.0	118	30.7	50.0

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

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: GEL400183	Client: CPRC001	Project: CPRC0X16037
Lab Sample ID: 400183001	Date Collected: 06/27/2016 09:34	Matrix: WATER
	Date Received: 06/28/2016 09:20	
Client ID: B35M16	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/13/2016 21:35	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1020	pCi/L	+/-227	301	317	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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

July 25, 2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 19, 2016
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 400183

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, QC Criteria, Range, Analyst, Date Time. Contains data for Rad Gas Flow and Rad Liquid Scintillation tests, including Strontium-90 and Carbon-14 measurements.

QC Summary

Workorder: 400183

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
<b>Rad Liquid Scintillation</b>										
Batch	1579141									
		Uncert:	+/-246	+/-316						
		TPU:	+/-374	+/-725						
QC1203578835	LCS									
Tritium	2320			1860	pCi/L	REC: 80	(80%-120%)		07/14/16	10:13
		Uncert:		+/-260						
		TPU:		+/-444						

**Notes:**

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

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
- < 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 >= 2X the MDA and, after corrections, result is >= 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 >= 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)

July 25, 2016

GEL LABORATORIES LLC

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QC Summary

Workorder: 400183

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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.