GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

April 03, 2018

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

Re: CHPRC SAF X18-005
Work Order: 445367
SDG: GEL445367

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 07, 2018. 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,

Anna Dupree for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: X18-005-007
Enclosures

Table of Contents

Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X18-005
SDG: GEL445367

April 03, 2018

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 March 07, 2018, 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. 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.

Sample Identification
The laboratory received the following sample:

Laboratory Identification	Sample Description
445367001	B3D7V0

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.

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.

Anna Dupree for
Heather Shaffer
Project Manager

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL445367
Work Order #: 445367

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
1203991255 (B3HLJ2PS)	Acetone	60* (70%-130%)
1203991257 (B3HLJ2PSD)	Acetone	58* (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.

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 4453607	C.O.C. # X18-005-007 Page 1 of 12

Collector: Juan Aguilar /CHPRC	**Contact/Requester:** WATERS-HUSTED, K	**Telephone No.:** 376-4650 3/6/18
SAF No.: X18-005	**Sampling Origin:** Hanford Site	**Purchase Order/Charge Code:** 300071
Project Title: Groundwater Background Study,	**Logbook No.:** HNF-N-506 -9915	**Ice Chest No.:** 6605-6615
Shipped To (Lab): GEL Laboratories, LLC	**Method of Shipment** Commercial Carrier	**Bill of Lading/Air Bill No.:** 7717 2851 1196
Protocol SURV	**Priority:** 30 Days	**Offsite Property No.:** 9113

POSSIBLE SAMPLE HAZARDS/REMARK
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS
Batch with A, I, S, and W SAFs.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3D7V0	N	W	3-5-18	1220	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2 / Cool <=6C

Relinquished By / Print First and Last Name	Signature	Date/Time	Received By / Print First and Last Name	Signature	Date/Time
Juan Aguilar /CHPRC		MAR 05 2018 1250	Daniel Klug /CHPRC	D. Klug	MAR 05 2018 1250
Daniel Klug CHPRC	D. Klug	MAR 05 2018 1400	SSU-1		MAR 05 2018 1400
SSU-1		MAR 06 2018 0715	Lesly Wall /CHPRC	Lesly Wall	MAR 06 2018 0715
Lesly Wall /CHPRC	Lesly Wall	MAR 06 2018 1400	FEDEX		

Matrix *

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:

Printed On 8/24/2017 FSR ID = FSR49940 A-6004-842 (REV 3)

APRIL 3, 2018

REV. 0

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST (continued)

445367

C.O.C. No. X18-005-007

Page 2 of 2

Relinquished By – Print	Relinquished By – Sign	Relinquished By – Date/Time	Received By – Print	Received By – Sign	Received By – Date/Time
Fed Ex			C. Tarplin	[signature]	3/7/18 0900

A-6003-962 (03/05)

APRIL 3, 2018

REV. 0

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

H5

Client: CPRC	SDG/AR/COC/Work Order: 445367
Received By: Chakeris Tarplin	Date Received: March 07, 2018
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 771730512354 (2.c) 771728511439 (2.c) 771728510888 (2.c) 771728511196 (2.c) 771735096241 (2.c) 771739185826 (2.c) 771728510947 (2.c) 771733474017 (2.c)

	Yes	No	
Suspected Hazard Information			*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?	X		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 (CPM) mR/Hr Classified as: (Rad 1) Rad 2 Rad 3
Is package, COC, and/or Samples marked HAZ?		X	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	X			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: (Wet Ice) Ice Packs Dry ice (None) Other: *all temperatures are recorded in Celsius TEMP:_____
4	Daily check performed and passed on IR temperature gun?	X			**Temperature Device Serial #:** IR4-17 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	X			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?		X		If Yes, Are Encores or Soil Kits present? Yes___ No X (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes X No___ N/A___ (If unknown, select No) VOA vials free of headspace? Yes___ No X N/A___ Sample ID's and containers affected: B3FVR8 1g5 B3HW19 1g4
8	Samples received within holding time?	X			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11	Number of containers received match number indicated on COC?	X			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			X	
13	COC form is properly signed in relinquished/received sections?	X			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials MEH Date 3/8/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

REV. 0
Report Date: 03−APR−18

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 (0rganics 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 analyte was detected in the associated method blank >/= MDC or >5% sample activity.	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 03 April 2018

State	Certification
Alaska	17−018
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	LA180011
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122018−1
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
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−18−13
Utah NELAP	SC000122018−26
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 #: GEL445367
Work Order #: 445367

Product: **Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method: SW846 8260C
Analytical Procedure: GL-OA-E-038 REV# 26
Analytical Batch: 1747916

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

GEL Sample ID#	Client Sample Identification
445367001	B3D7V0
1203991253	Method Blank (MB)
1203991254	Laboratory Control Sample (LCS)
1203991255	445658001(B3HLJ2) Post Spike (PS)
1203991257	445658001(B3HLJ2) Post Spike Duplicate (PSD)
1203992152	Method Blank (MB)
1203992153	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.

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
1203991255 (B3HLJ2PS)	Acetone	60* (70%-130%)
1203991257 (B3HLJ2PSD)	Acetone	58* (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: GEL445367 GEL Work Order: 445367

The Qualifiers in this report are defined as follows:

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: Erin Haubert **Name: Erin Haubert**

Date: 03 APR 2018 **Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	**GEL445367**	**Date Collected:**	**03/05/2018 12:20**	**Matrix:**	**WATER**
Lab Sample ID:	**445367001**	**Date Received:**	**03/07/2018 09:00**		
		Client:	**CPRC001**	**Project:**	**CPRC0X18005**
Client ID:	**B3D7V0**	**Method:**	**SW846 8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1747916**	**Inst:**	**VOA3.I**	**Dilution:**	**1**
Run Date:	**03/16/2018 17:30**	**Analyst:**	**JP1**	**Purge Vol:**	**5 mL**
Prep Date:	**03/16/2018 17:30**				
Data File:	**031618V3\3Z517.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	U	0.300	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	U	0.300	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	U	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

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

QC Summary

Report Date: April 3, 2018

CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: **Mr. Scot Fitzgerald**

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
QC1203991254 LCS											
1,1,1-Trichloroethane	50.0			45.9	ug/L		92	(70%-130%)	JP1	03/16/18	10:35
1,1,2-Trichloroethane	50.0			43.3	ug/L		87	(70%-130%)			
1,1-Dichloroethane	50.0			44.6	ug/L		89	(70%-130%)			
1,1-Dichloroethylene	50.0			46.5	ug/L		93	(70%-130%)			
1,2-Dichloroethane	50.0			41.9	ug/L		84	(70%-130%)			
2-Butanone	250			265	ug/L		106	(70%-130%)			
4-Methyl-2-pentanone	250			241	ug/L		96	(70%-130%)			
Acetone	250			254	ug/L		102	(70%-130%)			
Benzene	50.0			41.7	ug/L		83	(70%-130%)			
Carbon disulfide	250			225	ug/L		90	(70%-130%)			
Carbon tetrachloride	50.0			44.7	ug/L		89	(70%-130%)			
Chlorobenzene	50.0			45.7	ug/L		91	(70%-130%)			
Chloroform	50.0			45.5	ug/L		91	(70%-130%)			

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QC Summary

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
Ethylbenzene	50.0			49.6	ug/L		99	(70%-130%)	JP1	03/16/18	10:35
Methylene chloride	50.0			41.0	ug/L		82	(70%-130%)			
Tetrachloroethylene	50.0			46.0	ug/L		92	(70%-130%)			
Toluene	50.0			45.9	ug/L		92	(70%-130%)			
Trichloroethylene	50.0			45.2	ug/L		90	(70%-130%)			
Vinyl chloride	50.0			50.9	ug/L		102	(70%-130%)			
Xylenes (total)	150			149	ug/L		99	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			51.0	ug/L		102	(70%-130%)			
**Bromofluorobenzene	50.0			49.1	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			51.6	ug/L		103	(70%-130%)			
QC1203992153 LCS											
1,1,1-Trichloroethane	50.0			47.8	ug/L		96	(70%-130%)		03/19/18	12:05
1,1,2-Trichloroethane	50.0			46.4	ug/L		93	(70%-130%)			
1,1-Dichloroethane	50.0			46.0	ug/L		92	(70%-130%)			
1,1-Dichloroethylene	50.0			47.3	ug/L		95	(70%-130%)			
1,2-Dichloroethane	50.0			48.4	ug/L		97	(70%-130%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
2-Butanone	250			254	ug/L		102	(70%-130%)	JP1	03/19/18	12:05
4-Methyl-2-pentanone	250			249	ug/L		100	(70%-130%)			
Acetone	250			239	ug/L		95	(70%-130%)			
Benzene	50.0			44.3	ug/L		89	(70%-130%)			
Carbon disulfide	250			229	ug/L		92	(70%-130%)			
Carbon tetrachloride	50.0			47.3	ug/L		95	(70%-130%)			
Chlorobenzene	50.0			44.5	ug/L		89	(70%-130%)			
Chloroform	50.0			43.9	ug/L		88	(70%-130%)			
Ethylbenzene	50.0			47.1	ug/L		94	(70%-130%)			
Methylene chloride	50.0			41.9	ug/L		84	(70%-130%)			
Tetrachloroethylene	50.0			44.1	ug/L		88	(70%-130%)			
Toluene	50.0			44.4	ug/L		89	(70%-130%)			
Trichloroethylene	50.0			45.8	ug/L		92	(70%-130%)			
Vinyl chloride	50.0			53.8	ug/L		108	(70%-130%)			
Xylenes (total)	150			144	ug/L		96	(70%-130%)			

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QC Summary

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
**1,2-Dichloroethane-d4	50.0			55.3	ug/L		111	(70%-130%)	JP1	03/19/18	12:05
**Bromofluorobenzene	50.0			47.8	ug/L		96	(70%-130%)			
**Toluene-d8	50.0			49.2	ug/L		98	(70%-130%)			
QC1203991253 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					03/16/18	12:10
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						

GEL LABORATORIES LLC
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QC Summary

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
Chloroform			U	0.300	ug/L				JP1	03/16/18	12:10
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						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			55.1	ug/L		110	(70%-130%)			
**Bromofluorobenzene	50.0			50.2	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			48.8	ug/L		98	(70%-130%)			
QC1203992152 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					03/19/18	14:12
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						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1747916											
1,2-Dichloroethane			U	0.300	ug/L				JP1	03/19/18	14:12
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						
Vinyl chloride			U	0.300	ug/L						

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QC Summary

Workorder: **445367**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1747916										
Xylenes (total)			U	0.300	ug/L				JP1	03/19/18 14:12
**1,2-Dichloroethane-d4	50.0			56.0	ug/L		112	(70%-130%)		
**Bromofluorobenzene	50.0			50.4	ug/L		101	(70%-130%)		
**Toluene-d8	50.0			50.2	ug/L		100	(70%-130%)		
QC1203991255 445658001 PS										
1,1,1-Trichloroethane	50.0	U	0.00	46.3	ug/L		93	(70%-130%)		03/19/18 21:40
1,1,2-Trichloroethane	50.0	U	0.00	43.8	ug/L		88	(70%-130%)		
1,1-Dichloroethane	50.0	U	0.00	45.1	ug/L		90	(70%-130%)		
1,1-Dichloroethylene	50.0	U	0.00	45.7	ug/L		91	(70%-130%)		
1,2-Dichloroethane	50.0	U	0.00	46.3	ug/L		93	(70%-130%)		
2-Butanone	250	U	0.00	190	ug/L		76	(70%-130%)		
4-Methyl-2-pentanone	250	U	0.00	243	ug/L		97	(70%-130%)		
Acetone	250	JT	3.86	T 153	ug/L		60*	(70%-130%)		
Benzene	50.0	U	0.00	42.0	ug/L		84	(70%-130%)		
Carbon disulfide	250	U	0.00	221	ug/L		88	(70%-130%)		
Carbon tetrachloride	50.0	U	0.00	46.9	ug/L		94	(70%-130%)		

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1747916											
Chlorobenzene	50.0	U	0.00		42.2	ug/L		84	(70%-130%)	JP1	03/19/18 21:40
Chloroform	50.0	U	0.00		43.9	ug/L		88	(70%-130%)		
Ethylbenzene	50.0	U	0.00		45.8	ug/L		92	(70%-130%)		
Methylene chloride	50.0	U	0.00		40.6	ug/L		81	(70%-130%)		
Tetrachloroethylene	50.0	U	0.00		43.6	ug/L		87	(70%-130%)		
Toluene	50.0	U	0.00		43.4	ug/L		87	(70%-130%)		
Trichloroethylene	50.0	U	0.00		43.2	ug/L		86	(70%-130%)		
Vinyl chloride	50.0	U	0.00		49.7	ug/L		99	(70%-130%)		
Xylenes (total)	150	U	0.00		140	ug/L		93	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		57.4		55.4	ug/L		111	(70%-130%)		
**Bromofluorobenzene	50.0		54.0		48.7	ug/L		97	(70%-130%)		
**Toluene-d8	50.0		51.0		52.3	ug/L		105	(70%-130%)		
QC1203991257 445658001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		44.2	ug/L	4	88	(0%-20%)		03/19/18 22:12
1,1,2-Trichloroethane	50.0	U	0.00		46.2	ug/L	5	92	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		42.0	ug/L	7	84	(0%-20%)		

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1747916											
1,1-Dichloroethylene	50.0	U	0.00		44.2	ug/L	3	88	(0%-20%)	JP1	03/19/18 22:12
1,2-Dichloroethane	50.0	U	0.00		45.4	ug/L	2	91	(0%-20%)		
2-Butanone	250	U	0.00		186	ug/L	2	74	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		249	ug/L	2	100	(0%-20%)		
Acetone	250	JT	3.86	T	149	ug/L	3	58*	(0%-20%)		
Benzene	50.0	U	0.00		41.7	ug/L	1	83	(0%-20%)		
Carbon disulfide	250	U	0.00		210	ug/L	5	84	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		44.6	ug/L	5	89	(0%-20%)		
Chlorobenzene	50.0	U	0.00		43.7	ug/L	4	87	(0%-20%)		
Chloroform	50.0	U	0.00		42.1	ug/L	4	84	(0%-20%)		
Ethylbenzene	50.0	U	0.00		46.9	ug/L	2	94	(0%-20%)		
Methylene chloride	50.0	U	0.00		39.1	ug/L	4	78	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		43.7	ug/L	0	87	(0%-20%)		
Toluene	50.0	U	0.00		45.4	ug/L	4	91	(0%-20%)		
Trichloroethylene	50.0	U	0.00		42.0	ug/L	3	84	(0%-20%)		

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Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1747916											
Vinyl chloride	50.0	U	0.00		51.3	ug/L	3	103	(0%-20%)	JP1	03/19/18 22:12
Xylenes (total)	150	U	0.00		145	ug/L	3	97	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		57.4		52.8	ug/L		106	(70%-130%)		
**Bromofluorobenzene	50.0		54.0		47.7	ug/L		95	(70%-130%)		
**Toluene-d8	50.0		51.0		52.8	ug/L		106	(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 (0rganics 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: GEL445367

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203991254	LCS for batch 1747916	102	103	98
1203991253	MB for batch 1747916	110	98	100
445367001	B3D7V0	112	99	106
1203992153	LCS for batch 1747916	111	98	96
1203992152	MB for batch 1747916	112	100	101
1203991255	B3HLJ2PS	111	105	97
1203991257	B3HLJ2PSD	106	106	95

Surrogate		Acceptance Limits
DCED4	= 1,2-Dichloroethane-d4	(70%-130%)
TOL	= Toluene-d8	(70%-130%)
BFB	= Bromofluorobenzene	(70%-130%)

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted