

June 29, 2018

Rev 0



gel.com

June 25, 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: 451946
SDG: GEL451946

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 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: X18-005-247
Enclosures



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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X18-005
SDG: GEL451946**

June 25, 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 June 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
451946001	B3HLL8

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.

June 29, 2018

Rev 0


Anna Dupree for
Heather Shaffer
Project Manager

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL451946
Work Order #: 451946**

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.

Sample	Analyte	Value
1204046028 (Non SDG 451869002PS)	2-Butanone	58* (70%-130%)
	Acetone	36* (70%-130%)
1204046030 (Non SDG 451869002PSD)	2-Butanone	67* (70%-130%)
	Acetone	39* (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

CH2M Hill Plateau Remediation Company C.O.C.# X18-005-247 Page 1 of 1		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 451946	
Collector: WILLIAM COLLINS CHPRC	Contact/Requester: WATERS-HUSTED, K Telephone No.: 376-4650	Project Title: Groundwater Background Study,	Purchase Order/Charge Code: 300071
SAF No.: X18-005	Sampling Origin: Hanford Site	Logbook No.: HNF-N-506 98/95	Ice Chest No.: 625-735
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Priority: 30 Days	Bill of Lading/Air Bill No.: 772413885044
Protocol: SURV	Offsite Property No.: 9524	SPECIAL INSTRUCTIONS Batch with A, I, S, and W SAFs.	
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.: B3HLL8	Filter: N	Time: JUN 06 2018 0853	No/Type Container: 5x40-mL aGs*
Sample Analysis: 8260_VOA_GCMS: COMMON	Holding Time: 14 Days	Preservative: HCl or H2SO4 to pH <2 / Cool <=6C	

Relinquished By: WILLIAM COLLINS CHPRC	JUN 06 2018 1140 Date/Time	Received By: Leahy CHPRC	JUN 06 2018 1140 Date/Time
Signature	Signature	Signature	Signature
Relinquished By: Leahy CHPRC	JUN 06 2018 1400 Date/Time	Received By: FEDEX	JUN 06 2018 1400 Date/Time
Signature	Signature	Signature	Signature
Relinquished By: Fed Ex	JUN 06 2018 1400 Date/Time	Received By: Chakeris Tarplin GEL Laboratories	JUN 06 2018 1400 Date/Time
Signature	Signature	Signature	Signature
Relinquished By:	JUN 06 2018 1400 Date/Time	Received By:	JUN 06 2018 1400 Date/Time
Signature	Signature	Signature	Signature
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process):	Disposed By:	Date/Time:



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>451946</u>	
Received By: <u>C. TARPLIN</u>		Date Received: <u>06-07-2018</u> <u>HS</u>	
Carrier and Tracking Number		Circle Applicable: <u>FedEx Express</u> FedEx Ground UPS Field Services Courier Other	
		<u>772413885044</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>(CPM)</u> mR/Hr Classified as: <u>(Rad 1)</u> Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>(Wet Ice)</u> Ice Packs Dry ice None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>1°C</u>
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: _____ IR4-17 Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes ___ No <input checked="" type="checkbox"/> N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: <u>B34802 5 of 5</u>
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials CSJ Date 6/8/18 Page 1 of 1

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556-8171

Report Date: 25-JUN-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 (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 analyte was detected in the associated method blank \geq 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 \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 25 June 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 #: GEL451946
Work Order #: 451946**

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

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1772025

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
451946001	B3HLL8
1204046025	Method Blank (MB)
1204046026	Laboratory Control Sample (LCS)
1204046028	451869002(NonSDG) Post Spike (PS)
1204046030	451869002(NonSDG) Post Spike Duplicate (PSD)
1204052742	Method Blank (MB)
1204052744	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.

Sample	Analyte	Value
1204046028 (Non SDG 451869002PS)	2-Butanone	58* (70%-130%)
	Acetone	36* (70%-130%)
1204046030 (Non SDG 451869002PSD)	2-Butanone	67* (70%-130%)
	Acetone	39* (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: GEL451946 GEL Work Order: 451946

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.

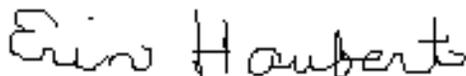
RA Indicates that sample is re-analyzed without re-extraction.

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:**Name: Erin Haubert****Date: 29 JUN 2018****Title: Data Validator**

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: GEL451946	Date Collected: 06/06/2018 08:53	Matrix: WATER
Lab Sample ID: 451946001	Date Received: 06/07/2018 09:00	
Client ID: B3HLL8	Client: CPRC001	Project: CPRC0X18005
Batch ID: 1772025	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/18/2018 18:17	Inst: VOA3.I	Dilution: 1
Prep Date: 06/18/2018 18:17	Analyst: JP1	Purge Vol: 5 mL
Data File: 061818V3\3M119.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	U	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: June 29, 2018

Page 1 of 10

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 451946

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
QC1204046026	LCS										
1,1,1-Trichloroethane	50.0			49.9	ug/L		100	(70%-130%)	JP1	06/08/18	09:36
1,1,2-Trichloroethane	50.0			50.3	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0			46.6	ug/L		93	(70%-130%)			
1,1-Dichloroethylene	50.0			47.8	ug/L		96	(70%-130%)			
1,2-Dichloroethane	50.0			44.8	ug/L		90	(70%-130%)			
2-Butanone	250			226	ug/L		90	(70%-130%)			
4-Methyl-2-pentanone	250			235	ug/L		94	(70%-130%)			
Acetone	250			205	ug/L		82	(70%-130%)			
Benzene	50.0			48.1	ug/L		96	(70%-130%)			
Carbon disulfide	250			261	ug/L		105	(70%-130%)			
Carbon tetrachloride	50.0			50.2	ug/L		100	(70%-130%)			
Chlorobenzene	50.0			52.1	ug/L		104	(70%-130%)			
Chloroform	50.0			49.8	ug/L		100	(70%-130%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 451946

Page 2 of 10

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
Ethylbenzene	50.0			50.4	ug/L		101	(70%-130%)	JP1	06/08/18	09:36
Methylene chloride	50.0			49.1	ug/L		98	(70%-130%)			
Tetrachloroethylene	50.0			50.2	ug/L		100	(70%-130%)			
Toluene	50.0			49.7	ug/L		99	(70%-130%)			
Trichloroethylene	50.0			50.6	ug/L		101	(70%-130%)			
Vinyl chloride	50.0			45.2	ug/L		90	(70%-130%)			
Xylenes (total)	150			158	ug/L		105	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			48.7	ug/L		97	(70%-130%)			
**Bromofluorobenzene	50.0			49.0	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			51.1	ug/L		102	(70%-130%)			
QC1204052744	LCS										
1,1,1-Trichloroethane	50.0			52.4	ug/L		105	(70%-130%)		06/18/18	09:58
1,1,2-Trichloroethane	50.0			50.2	ug/L		100	(70%-130%)			
1,1-Dichloroethane	50.0			48.4	ug/L		97	(70%-130%)			
1,1-Dichloroethylene	50.0			49.0	ug/L		98	(70%-130%)			
1,2-Dichloroethane	50.0			47.8	ug/L		96	(70%-130%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 451946

Page 3 of 10

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
2-Butanone	250			241	ug/L		96	(70%-130%)	JP1	06/18/18	09:58
4-Methyl-2-pentanone	250			229	ug/L		92	(70%-130%)			
Acetone	250			225	ug/L		90	(70%-130%)			
Benzene	50.0			48.9	ug/L		98	(70%-130%)			
Carbon disulfide	250			268	ug/L		107	(70%-130%)			
Carbon tetrachloride	50.0			54.2	ug/L		108	(70%-130%)			
Chlorobenzene	50.0			51.6	ug/L		103	(70%-130%)			
Chloroform	50.0			52.3	ug/L		105	(70%-130%)			
Ethylbenzene	50.0			50.1	ug/L		100	(70%-130%)			
Methylene chloride	50.0			48.7	ug/L		97	(70%-130%)			
Tetrachloroethylene	50.0			51.5	ug/L		103	(70%-130%)			
Toluene	50.0			48.4	ug/L		97	(70%-130%)			
Trichloroethylene	50.0			51.5	ug/L		103	(70%-130%)			
Vinyl chloride	50.0			50.3	ug/L		101	(70%-130%)			
Xylenes (total)	150			149	ug/L		99	(70%-130%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 451946

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
**1,2-Dichloroethane-d4	50.0			53.4	ug/L		107	(70%-130%)	JP1	06/18/18	09:58
**Bromofluorobenzene	50.0			48.8	ug/L		98	(70%-130%)			
**Toluene-d8	50.0			51.7	ug/L		103	(70%-130%)			
QC1204046025	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/08/18	11:40
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						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
Chloroform			U	0.300	ug/L				JP1	06/08/18	11:40
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			50.7	ug/L		101	(70%-130%)			
**Bromofluorobenzene	50.0			48.5	ug/L		97	(70%-130%)			
**Toluene-d8	50.0			51.8	ug/L		104	(70%-130%)			
QC1204052742 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/18/18	12:03
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	1772025										
1,2-Dichloroethane			U	0.300	ug/L				JP1	06/18/18	12:03
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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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
Xylenes (total)			U	0.300	ug/L				JP1	06/18/18	12:03
**1,2-Dichloroethane-d4	50.0			52.4	ug/L		105	(70%-130%)			
**Bromofluorobenzene	50.0			46.7	ug/L		93	(70%-130%)			
**Toluene-d8	50.0			47.7	ug/L		95	(70%-130%)			
QC1204046028 451869002 PS											
1,1,1-Trichloroethane	50.0	U	0.00	48.8	ug/L		98	(70%-130%)		06/08/18	19:59
1,1,2-Trichloroethane	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	48.5	ug/L		97	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	45.2	ug/L		90	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	45.9	ug/L		92	(70%-130%)			
2-Butanone	250	TU	0.00 T	145	ug/L		58 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	213	ug/L		85	(70%-130%)			
Acetone	250	TU	2.50 T	91.4	ug/L		36 *	(70%-130%)			
Benzene	50.0	U	0.00	50.7	ug/L		101	(70%-130%)			
Carbon disulfide	250	U	0.00	248	ug/L		99	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	47.9	ug/L		96	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
Chlorobenzene	50.0	U	0.00	49.8	ug/L		100	(70%-130%)	JP1	06/08/18	19:59
Chloroform	50.0	J	0.900	50.5	ug/L		99	(70%-130%)			
Ethylbenzene	50.0	U	0.00	49.2	ug/L		98	(70%-130%)			
Methylene chloride	50.0	U	0.00	50.5	ug/L		101	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	49.9	ug/L		100	(70%-130%)			
Toluene	50.0	J	0.410	50.2	ug/L		100	(70%-130%)			
Trichloroethylene	50.0	U	0.00	49.1	ug/L		98	(70%-130%)			
Vinyl chloride	50.0	U	0.00	40.7	ug/L		81	(70%-130%)			
Xylenes (total)	150	J	0.320	149	ug/L		99	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		52.0	49.8	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0		46.5	47.9	ug/L		96	(70%-130%)			
**Toluene-d8	50.0		52.0	51.2	ug/L		102	(70%-130%)			
QC1204046030 451869002 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	49.3	ug/L	1	99	(0%-20%)		06/08/18	20:30
1,1,2-Trichloroethane	50.0	U	0.00	54.8	ug/L	8	110	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	49.0	ug/L	1	98	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
1,1-Dichloroethylene	50.0	U	0.00		45.6	ug/L	1	91	(0%-20%)	JP1	06/08/18 20:30
1,2-Dichloroethane	50.0	U	0.00		46.0	ug/L	0	92	(0%-20%)		
2-Butanone	250	TU	0.00	T	166	ug/L	14	67*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		248	ug/L	15	99	(0%-20%)		
Acetone	250	TU	2.50	T	99.8	ug/L	9	39*	(0%-20%)		
Benzene	50.0	U	0.00		49.7	ug/L	2	99	(0%-20%)		
Carbon disulfide	250	U	0.00		264	ug/L	6	106	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		50.0	ug/L	4	100	(0%-20%)		
Chlorobenzene	50.0	U	0.00		52.9	ug/L	6	106	(0%-20%)		
Chloroform	50.0	J	0.900		50.9	ug/L	1	100	(0%-20%)		
Ethylbenzene	50.0	U	0.00		50.5	ug/L	3	101	(0%-20%)		
Methylene chloride	50.0	U	0.00		49.4	ug/L	2	99	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		52.8	ug/L	6	106	(0%-20%)		
Toluene	50.0	J	0.410		54.7	ug/L	8	109	(0%-20%)		
Trichloroethylene	50.0	U	0.00		48.3	ug/L	2	97	(0%-20%)		

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1772025										
Vinyl chloride	50.0	U	0.00		40.5	ug/L	0	81	(0%-20%)	JP1	06/08/18 20:30
Xylenes (total)	150	J	0.320		158	ug/L	6	105	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		52.0		49.9	ug/L		100	(70%-130%)		
**Bromofluorobenzene	50.0		46.5		49.8	ug/L		100	(70%-130%)		
**Toluene-d8	50.0		52.0		52.9	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 (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
 ^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.
 For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Volatile

Surrogate Recovery Report

SDG Number: GEL451946

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1204046026	LCS for batch 1772025	97	102	98
1204046025	MB for batch 1772025	101	104	97
1204046028	B3JLB7PS	100	102	96
1204046030	B3JLB7PSD	100	106	100
1204052744	LCS for batch 1772025	107	103	98
1204052742	MB for batch 1772025	105	95	93
451946001	B3HLL8	112	102	92

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