

May 23, 2016

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

Re: CHPRC SAF X16-005
Work Order: 396193
SDG: GEL396193

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 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: 300071ES20 - 7H
Chain of Custody: X16-005-184
Enclosures

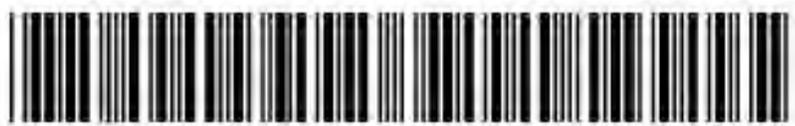


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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-005
SDG: GEL396193**

May 23, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on April 28, 2016, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. 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 sample:

Laboratory Identification	Sample Description
396193001	B34WR6

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.

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

**GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL396193
Work Order #: 396193**

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
1203538672 (Non SDG 396094001PS)	Acetone	61* (70%-130%)
1203538673 (Non SDG 396094001PSD)	Acetone	57* (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.

SAMPLE ISSUE RESOLUTION

SIR NUM	SIR16-355
REV NUM	0
DATE INITIATED	5/18/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) X16-005
OPERABLE UNIT(S) NONE
PROJECT(S) SURV16
SAMPLE EVENT TITLE(S) SURV16
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B34WR6
SAMPLE MATRIX WATER
COLLECTION DATE 4/27/2016 - 4/27/2016
SDG NUM GEL396193

ISSUE BACKGROUND

CLASS Laboratory Issue
TYPE Chain of Custody Issue
DESCRIPTION COC X16-005-184 SAMPLE B34WR6
 INCORRECT RECEIVED BY DATE

DISPOSITION

DESCRIPTION DOCUMENT AND CLOSE
JUSTIFICATION DOCUMENT AND CLOSE

SUBMITTED BY: Gayelyn Gibson DATE: 04/28/2016
 ACCEPTED BY: Kirsten Killand DATE: 05/18/2016

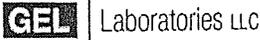
Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		C.O.C. # X16-005-184	
396193		Page 1 of 1	
Collector	J.R. Aguilar/CHPRC	Telephone No.	376-4650
SAF No.	X16-005	Purchase Order/Charge Code	300071
Project Title	GW Sitewide Surv, FY16	Ice Chest No.	GW5-288
Shipped To (Lab)	GEL Laboratories, LLC	Bill of Lading/Air Bill No.	76208421400
Protocol	SURV	Offsite Property No.	6563
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS Hold Time Batch with A, I, S, and W SAFs.	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Contact/Requester	WATERS-HUSTED, K	Sampling Origin	Hanford Site
Logbook No.	HNF-N-506 85 / 46	Method of Shipment	Commercial Carrier
Priority:	30 Days	Priority:	PRIORITY
Sample No.	B34WR6	Filter	N
Date	4-27-16	Time	0930
No/Type Container	4x40-ml aGs*	Sample Analysis	8260_VOA_GCMS: COMMON
Holding Time	14 Days	Preservative	HCl or H2SO4 to pH <2/Cool <=6C

Relinquished By	J.R. Aguilar/CHPRC	Print	[Signature]	Sign		Received By	Troy Bacon/CHPRC	Print	Troy L. Bacon	Sign	[Signature]
Date/Time	APR 27 2016	Date/Time	APR 27 2016	Date/Time	APR 27 2016	Date/Time	APR 27 2016	Date/Time	10:20	Date/Time	10:20
Relinquished By	Troy Bacon/CHPRC	Print	[Signature]	Sign		Received By	FEDEX	Print		Sign	
Date/Time	APR 27 2016	Date/Time	APR 27 2016	Date/Time	APR 27 2016	Date/Time		Date/Time		Date/Time	
Relinquished By	[Signature]	Print	[Signature]	Sign		Received By	M. Kirsten [Signature]	Print	[Signature]	Sign	[Signature]
Date/Time		Date/Time		Date/Time		Date/Time	4/28/16	Date/Time	0900	Date/Time	4/28/16
Relinquished By		Print		Sign		Received By		Print		Sign	
Date/Time		Date/Time		Date/Time		Date/Time		Date/Time		Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)										
Disposed By	KNS 4/28/16										
Date/Time											

FRS ID = FSR26296

PRINTED ON 3/16/2016



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CAPRC</u>		SDG/AR/COC/Work Order: <u>3910193</u>
Received By: <u>MTK</u>		Date Received: <u>4-28-16</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.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>CPMD</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>13046296</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7	VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9	Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7762 0842 1400</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 4/28/16 Page 1 of 1

Data Review Qualifier Definitions

GEL LABORATORIES LLC

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

Report Date: 23-MAY-16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 23 May 2016

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

Volatile Analysis

Case Narrative

**GC/MS Volatile
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL396193
 Work Order #: 396193**

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

Analytical Method: SW846 8260C

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

Analytical Batch: 1563557

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
396193001	B34WR6
1203538670	Method Blank (MB)
1203538671	Laboratory Control Sample (LCS)
1203538672	396094001(NonSDG) Post Spike (PS)
1203538673	396094001(NonSDG) 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
1203538672 (Non SDG 396094001PS)	Acetone	61* (70%-130%)
1203538673 (Non SDG 396094001PSD)	Acetone	57* (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: GEL396193 GEL Work Order: 396193

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: 21 MAY 2016

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: GEL396193	Date Collected: 04/27/2016 09:30	Matrix: WATER
Lab Sample ID: 396193001	Date Received: 04/28/2016 09:00	
Client ID: B34WR6	Client: CPRC001	Project: CPRC0X16005
Batch ID: 1563557	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 04/29/2016 12:22	Inst: VOA3.I	Dilution: 1
Prep Date: 04/29/2016 12:22	Analyst: CDS1	Purge Vol: 5 mL
Data File: 042916V3\3G510.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	J	3.67	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: May 17, 2016

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

Workorder: 396193

Parname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS										
Batch	1563557									
QC1203538671	LCS									
1,1,1-Trichloroethane	50.0		50.4	ug/L		101	(70%-130%)	CDS1	04/29/16	08:13
1,1,2-Trichloroethane	50.0		45.1	ug/L		90	(70%-130%)			
1,1-Dichloroethane	50.0		49.7	ug/L		99	(70%-130%)			
1,1-Dichloroethylene	50.0		48.8	ug/L		98	(70%-130%)			
1,2-Dichloroethane	50.0		49.2	ug/L		98	(70%-130%)			
2-Butanone	250		261	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250		212	ug/L		85	(70%-130%)			
Acetone	250		266	ug/L		106	(70%-130%)			
Benzene	50.0		49.9	ug/L		100	(70%-130%)			
Carbon disulfide	250		242	ug/L		97	(70%-130%)			
Carbon tetrachloride	50.0		47.7	ug/L		95	(70%-130%)			
Chlorobenzene	50.0		46.1	ug/L		92	(70%-130%)			
Chloroform	50.0		48.1	ug/L		96	(70%-130%)			
Ethylbenzene	50.0		44.0	ug/L		88	(70%-130%)			
Methylene chloride	50.0		48.4	ug/L		97	(70%-130%)			
Tetrachloroethylene	50.0		43.1	ug/L		86	(70%-130%)			
Toluene	50.0		45.6	ug/L		91	(70%-130%)			
Trichloroethylene	50.0		48.0	ug/L		96	(70%-130%)			
Vinyl chloride	50.0		43.5	ug/L		87	(70%-130%)			
Xylenes (total)	150		133	ug/L		88	(70%-130%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 396193

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1563557										
**1,2-Dichloroethane-d4	50.0			45.6	ug/L		91	(70%-130%)	CDS1	04/29/16	08:13
**Bromofluorobenzene	50.0			51.8	ug/L		104	(70%-130%)			
**Toluene-d8	50.0			45.5	ug/L		91	(70%-130%)			
QC1203538670	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					04/29/16	09:14
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						

GEL LABORATORIES LLC

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

QC Summary

Workorder: 396193

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1563557										
Vinyl chloride			U	0.300	ug/L				CDS1	04/29/16	09:14
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			46.1	ug/L		92	(70%-130%)			
**Bromofluorobenzene	50.0			47.7	ug/L		95	(70%-130%)			
**Toluene-d8	50.0			48.1	ug/L		96	(70%-130%)			
QC1203538672 396094001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	56.8	ug/L		114	(70%-130%)		04/29/16	12:54
1,1,2-Trichloroethane	50.0	U	0.00	47.1	ug/L		94	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	55.3	ug/L		111	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	53.3	ug/L		107	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	51.9	ug/L		104	(70%-130%)			
2-Butanone	250	U	0.00	187	ug/L		75	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	218	ug/L		87	(70%-130%)			
Acetone	250	TU	0.00 T	152	ug/L		61 *	(70%-130%)			
Benzene	50.0	U	0.00	53.8	ug/L		108	(70%-130%)			
Carbon disulfide	250	U	0.00	272	ug/L		109	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	53.7	ug/L		107	(70%-130%)			
Chlorobenzene	50.0	U	0.00	49.2	ug/L		98	(70%-130%)			
Chloroform	50.0	U	0.00	51.9	ug/L		104	(70%-130%)			
Ethylbenzene	50.0	U	0.00	49.6	ug/L		99	(70%-130%)			
Methylene chloride	50.0	U	0.00	51.8	ug/L		104	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	48.7	ug/L		97	(70%-130%)			

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QC Summary

Workorder: 396193

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Parname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch	1563557											
Toluene	50.0	U	0.00		49.3	ug/L		99	(70%-130%)	CDS1	04/29/16	12:54
Trichloroethylene	50.0	U	0.00		53.3	ug/L		107	(70%-130%)			
Vinyl chloride	50.0	U	0.00		44.7	ug/L		89	(70%-130%)			
Xylenes (total)	150	U	0.00		147	ug/L		98	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		47.8		45.1	ug/L		90	(70%-130%)			
**Bromofluorobenzene	50.0		48.8		48.9	ug/L		98	(70%-130%)			
**Toluene-d8	50.0		48.7		45.7	ug/L		91	(70%-130%)			
QC1203538673 396094001 PSD												
1,1,1-Trichloroethane	50.0	U	0.00		53.0	ug/L	7	106	(0%-20%)		04/29/16	13:24
1,1,2-Trichloroethane	50.0	U	0.00		46.3	ug/L	2	93	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00		52.8	ug/L	5	106	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00		51.0	ug/L	4	102	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00		48.7	ug/L	6	97	(0%-20%)			
2-Butanone	250	U	0.00		174	ug/L	7	70	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00		209	ug/L	4	84	(0%-20%)			
Acetone	250	TU	0.00	T	143	ug/L	6	57*	(0%-20%)			
Benzene	50.0	U	0.00		51.4	ug/L	5	103	(0%-20%)			
Carbon disulfide	250	U	0.00		254	ug/L	7	102	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00		51.5	ug/L	4	103	(0%-20%)			
Chlorobenzene	50.0	U	0.00		47.5	ug/L	3	95	(0%-20%)			
Chloroform	50.0	U	0.00		49.8	ug/L	4	100	(0%-20%)			
Ethylbenzene	50.0	U	0.00		47.4	ug/L	5	95	(0%-20%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1563557										
Methylene chloride	50.0	U	0.00	49.0	ug/L	5	98	(0%-20%)	CDS1	04/29/16	13:24
Tetrachloroethylene	50.0	U	0.00	47.9	ug/L	2	96	(0%-20%)			
Toluene	50.0	U	0.00	48.5	ug/L	2	97	(0%-20%)			
Trichloroethylene	50.0	U	0.00	51.9	ug/L	3	104	(0%-20%)			
Vinyl chloride	50.0	U	0.00	47.2	ug/L	5	94	(0%-20%)			
Xylenes (total)	150	U	0.00	140	ug/L	5	93	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		47.8	43.5	ug/L		87	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	49.3	ug/L		99	(70%-130%)			
**Toluene-d8	50.0		48.7	45.0	ug/L		90	(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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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	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.

^ 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: GEL396193

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203538671	LCS for batch 1563557	91	91	104
1203538670	MB for batch 1563557	92	96	95
396193001	B34WR6	99	98	94
1203538672	B34KH6PS	90	91	98
1203538673	B34KH6PSD	87	90	99

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