GEL Laboratories LLC
a member of The GEL Group INC

July 30, 2014

Rev. 1

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178
www.gel.com

July 28, 2014

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

Re: CHPRC SAF I14-029
Work Order: 348658
SDG: GEL348658

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 14, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This data package was revised per enclosed P&D: The EDD will be revised to report VOAs at the MDL.

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,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: I14-029-012 and I14-029-013
Enclosures

Table of Contents

Case Narrative

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This data package was revised per enclosed P&D: The EDD will be revised to report VOAs at the MDL.

General Narrative
for
Hanford MSA (51204)
CHPRC SAF I14-029
SDG: GEL348658

July 28, 2014

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 May 14, 2014, 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

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
348658001	B2WD52
348658002	B2WD53

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. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

348658

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **I14-029-012**

Page 1 of 1

Collector	SCOTT KING	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	I14-029	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071ES20
Project Title	2ZP1, MAY 2014	**Logbook No.**	HNF-N-506 04 / 34	**Ice Chest No.**	6005-060
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7988459
Protocol	CERCLA	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	4793

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2WD52	N	W	MAY 13 2014	0700	4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
~~B2WD52~~	~~N~~	~~W~~			~~1x20-mL P~~	~~Activity Scan~~	~~6 Months~~	~~None~~ KS 5/12/14

July 30, 2014

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	SCOTT KING	Scott King	MAY 13 2014 1010		K. Compton	K. Compton	MAY 13 2014 1010
	K. Compton	K. Compton	MAY 13 2014 1050		FM Hall CHPRC		MAY 13 2014 1050
	FM Hall CHPRC		MAY 13 2014 1400		FED EX		
	Fed Ex				Jen Pellegrini		5-14-14 0915

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		

Rev. 1

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

PRINTED O 4/21/2014

A-6004-842 (REV 2)

Revision #1

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # I14-029-013
		Page 1 of 1

Collector	SCOTT KING	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	I14-029	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071ES20
Project Title	2ZP1, MAY 2014	**Logbook No.**	HNF-N-506 64/34	**Ice Chest No.**	6WS-060
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7988 4596 7890
Protocol	CERCLA	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	4793

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2WD53	N	W	MAY 13 2014	0855	4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
~~B2WD53~~	~~N~~	~~W~~			~~1x20-mL P~~	~~Activity Scan~~	~~6 Months~~	~~None~~ KS 5/12/14

July 30, 2014

Relinquished By	Print / Sign	Date/Time	Received By	Print / Sign	Date/Time
SCOTT KING	Scott King	MAY 13 2014 1010	K. Campbell	K. Campbell	MAY 13 2014 1010
K. Campbell	K. Campbell	MAY 13 2014 1050	FM Hall CHPRC	FM Hall	MAY 13 2014 1050
FM Hall CHPRC	FM Hall	MAY 13 2014 1400	FED EX		
Fed Ex			Jen Pellegrini	JP	5-14-14 0915

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

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	

Rev. 1

PRINTED O 4/21/2014

A-6004-842 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: HMSA	SDG/AR/COC/Work Order: 348656 / 348657 / 348658 / 348682
Received By: JP	Date Received: 5-14-14

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?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	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?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 3
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130462961 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 7988 4596 7890

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials OP Date 5-14-14 Page 1 of 1

Problem and Discrepancy Report

July 30, 2014 Rev. 1

Problem and Discrepancy Report

SDGs

GEL349221 GEL348559 GEL349334 GEL349571 GEL348657 GEL348682
GEL349473 GEL349208 GEL349574 GEL348302 GEL349214 GEL348658

7/16/2014

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1. The data package has the following issues:

a) The listed SDGs need to have the VOAs re-reported as MDL not PQL.

Resolution: *Provide correction.*

Lab Response:

The lab will submit a revised EDD and send a revised data package to narrate the revision.

Provide a resolution to each issue noted on the report
Page **1** of **1**

Data Review Qualifier Definitions

GEL LABORATORIES LLC

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

Report Date: 28−JUL−14

Project Specific Qualifier Definitions for GEL Client Code: HMSA

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	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	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol−condensation product	Y	Organics	Semi−Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H h flags. In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	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).	Y	Inorganics	Metals	Replaces J
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (0rganics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely preformed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	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).	Y	General Chemistry		Replaces J
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.	Y	Inorganics	Metals	Replaces B
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.	Y	General Chemistry		Replaces B
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

Laboratory Certifications

List of current GEL Certifications as of 28 July 2014

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−14−9
Utah NELAP	SC000122014−13
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12
Wisconsin	999887790

Volatile Analysis

Case Narrative

July 30, 2014 Rev. 1

ChemStation Case Narrative
Hanford MSA (HMSA)
SDG GEL348658

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 8260C
Analytical Batch Number:	1387956

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
348658001	B2WD52
348658002	B2WD53
1203088526	Method Blank (MB)
1203088529	Laboratory Control Sample (LCS)
1203088530	Laboratory Control Sample (LCS)
1203088531	348558001(B2WD49) Post Spike (PS)
1203088532	348558001(B2WD49) Post Spike Duplicate (PSD)
1203088873	348558001(B2WD49) Post Spike (PS)
1203088874	348558001(B2WD49) Post Spike Duplicate (PSD)
1203089345	Method Blank (MB)
1203089346	Laboratory Control Sample (LCS)
1203089347	Laboratory Control Sample (LCS)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration
The initial calibration requirements were not all met. Please see the Data Exception Report in the miscellaneous section of the deliverable.

Continuing Calibration Verification Requirements
The calibration verification standard requirements were not all met. Please see the Data Exception Report in the miscellaneous section of the deliverable.

Quality Control (QC) Information

Blank (MB) Statement
The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS 1203089347 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

QC Sample Designation
Sample 348558001 (B2WD49) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement
The spike recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement
The spike duplicate recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Relative Percent Difference (RPD) Statement
The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance
The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Sample Preservation and Integrity

Preservation was indicated on the vials, however the sample pH values were above 2. All samples were pH 3 at the time of analysis. The samples were analyzed within 7 days from collection.

Sample Dilutions/Methanol Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
The following DER was generated for this SDG: 1293696.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment
Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments
Additional comments were not required for this SDG.

Residual Chlorine
Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA2.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890N/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all 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

HMSA001 Hanford MSA (51204)

Client SDG: GEL348658 GEL Work Order: 348658

The Qualifiers in this report are defined as follows:

B The analyte was detected in both the associated QC blank and in the sample.

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.

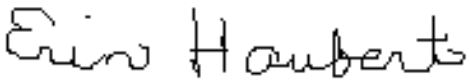
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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: 06 JUN 2014 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC Rev. 1

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF I14-029**

Report Date: June 6, 2014

Client Sample ID: B2WD52
Lab Sample ID: 348658001
Matrix: WATER
Collect Date: 13-MAY-14 07:00
Receive Date: 14-MAY-14
Collector: Client

Proiect: HMSA00146
Client ID: HMSA001
Client SDG: GEL348658

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260_VOA_GCMS_IX: COMMON "As Received"												
1,1,1,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1	CDS1	05/15/14	13:16	1387956	1
1,1,1-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	2.00	10.0	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	2.00	10.0	ug/L	1					
1,2,3-Trichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dibromo-3-chloropropane	U	ND	0.500	2.00	2.00	ug/L	1					
1,2-Dibromoethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
2-Butanone	TU	ND	3.00	10.0	10.0	ug/L	1					
2-Chloro-1,3-butadiene	TU	ND	0.300	2.00	2.00	ug/L	1					
2-Hexanone	U	ND	3.00	10.0	10.0	ug/L	1					
4-Methyl-2-pentanone	U	ND	3.00	10.0	10.0	ug/L	1					
Acetone	TU	ND	3.00	10.0	20.0	ug/L	1					
Acetonitrile	U	ND	16.7	50.0	50.0	ug/L	1					
Acrolein	U	ND	3.00	10.0	10.0	ug/L	1					
Acrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					
Allyl chloride	U	ND	3.00	10.0	10.0	ug/L	1					
Benzene	U	ND	0.300	2.00	5.00	ug/L	1					
Bromoform	U	ND	0.300	2.00	2.00	ug/L	1					
Carbon disulfide	U	ND	1.60	10.0	5.00	ug/L	1					
Carbon tetrachloride	U	ND	0.300	2.00	5.00	ug/L	1					
Chlorobenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Chloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
Chloroform	U	ND	0.300	2.00	5.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dibromomethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dichlorodifluoromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Ethyl methacrylate	U	ND	3.00	10.0	10.0	ug/L	1					
Ethylbenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Iodomethane	U	ND	3.00	10.0	10.0	ug/L	1					
Isobutyl alcohol	U	ND	33.0	100	100	ug/L	1					
Methacrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					

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July 30, 2014 Rev. 1

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF I14-029**

Report Date: June 6, 2014

Client Sample ID: B2WD52
Lab Sample ID: 348658001

Project: HMSA00146
Client ID: HMSA001
Client SDG: GEL348658

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260_VOA_GCMS_IX: COMMON "As Received"												
Methylene chloride	U	ND	1.60	5.00	5.00	ug/L	1					
Styrene	U	ND	0.300	2.00	2.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	2.00	5.00	ug/L	1					
Toluene	U	ND	0.300	2.00	5.00	ug/L	1					
Trichloroethene	U	ND	0.300	2.00	5.00	ug/L	1					
Vinyl acetate	U	ND	1.60	5.00	5.00	ug/L	1					
Vinyl chloride	U	ND	0.300	2.00	10.0	ug/L	1					
Xylenes (total)	U	ND	0.300	6.00	10.0	ug/L	1					
cis-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,4-Dichloro-2-butene	U	ND	1.50	10.0	10.0	ug/L	1					

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS_IX: COMMON "As Received"	46.9 ug/L	50.0	93.7	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS_IX: COMMON "As Received"	52.2 ug/L	50.0	104	(80%-120%)
Toluene-d8	8260_VOA_GCMS_IX: COMMON "As Received"	49.1 ug/L	50.0	98.2	(80%-120%)

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Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF I14-029**

Report Date: June 6, 2014

Client Sample ID: B2WD53
Lab Sample ID: 348658002
Matrix: WATER
Collect Date: 13-MAY-14 08:55
Receive Date: 14-MAY-14
Collector: Client

Project: HMSA00146
Client ID: HMSA001
Client SDG: GEL348658

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260_VOA_GCMS_IX: COMMON "As Received"												
1,1,1,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1	CDS1	05/15/14	13:46	1387956	1
1,1,1-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	2.00	10.0	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	2.00	10.0	ug/L	1					
1,2,3-Trichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dibromo-3-chloropropane	U	ND	0.500	2.00	2.00	ug/L	1					
1,2-Dibromoethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
2-Butanone	TU	ND	3.00	10.0	10.0	ug/L	1					
2-Chloro-1,3-butadiene	TU	ND	0.300	2.00	2.00	ug/L	1					
2-Hexanone	U	ND	3.00	10.0	10.0	ug/L	1					
4-Methyl-2-pentanone	U	ND	3.00	10.0	10.0	ug/L	1					
Acetone	TU	ND	3.00	10.0	20.0	ug/L	1					
Acetonitrile	U	ND	16.7	50.0	50.0	ug/L	1					
Acrolein	U	ND	3.00	10.0	10.0	ug/L	1					
Acrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					
Allyl chloride	U	ND	3.00	10.0	10.0	ug/L	1					
Benzene	U	ND	0.300	2.00	5.00	ug/L	1					
Bromoform	U	ND	0.300	2.00	2.00	ug/L	1					
Carbon disulfide	U	ND	1.60	10.0	5.00	ug/L	1					
Carbon tetrachloride	J	4.09	0.300	2.00	5.00	ug/L	1					
Chlorobenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Chloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
Chloroform	J	1.04	0.300	2.00	5.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dibromomethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dichlorodifluoromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Ethyl methacrylate	U	ND	3.00	10.0	10.0	ug/L	1					
Ethylbenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Iodomethane	U	ND	3.00	10.0	10.0	ug/L	1					
Isobutyl alcohol	U	ND	33.0	100	100	ug/L	1					
Methacrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					

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July 30, 2014 Rev. 1

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF I14-029**

Report Date: June 6, 2014

Client Sample ID: B2WD53
Lab Sample ID: 348658002

Project: HMSA00146
Client ID: HMSA001
Client SDG: GEL348658

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260_VOA_GCMS_IX: COMMON "As Received"												
Methylene chloride	U	ND	1.60	5.00	5.00	ug/L	1					
Styrene	U	ND	0.300	2.00	2.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	2.00	5.00	ug/L	1					
Toluene	U	ND	0.300	2.00	5.00	ug/L	1					
Trichloroethene	J	2.43	0.300	2.00	5.00	ug/L	1					
Vinyl acetate	U	ND	1.60	5.00	5.00	ug/L	1					
Vinyl chloride	U	ND	0.300	2.00	10.0	ug/L	1					
Xylenes (total)	U	ND	0.300	6.00	10.0	ug/L	1					
cis-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,4-Dichloro-2-butene	U	ND	1.50	10.0	10.0	ug/L	1					

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS_IX: COMMON "As Received"	46.5 ug/L	50.0	92.9	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS_IX: COMMON "As Received"	52.4 ug/L	50.0	105	(80%-120%)
Toluene-d8	8260_VOA_GCMS_IX: COMMON "As Received"	50.1 ug/L	50.0	100	(80%-120%)

Quality Control Summary

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

QC Summary

Report Date: June 6, 2014

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1387956											
QC1203088529 LCS											
1,1,1,2-Tetrachloroethane	50.0			47.9	ug/L		95.8	(70%-130%)	CDS1	05/14/14	07:50
1,1,1-Trichloroethane	50.0			51.1	ug/L		102	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0			48.7	ug/L		97.3	(70%-130%)			
1,1,2-Trichloroethane	50.0			47.0	ug/L		93.9	(70%-130%)			
1,1-Dichloroethane	50.0			44.3	ug/L		88.6	(70%-130%)			
1,1-Dichloroethylene	50.0			45.6	ug/L		91.2	(70%-130%)			
1,2,3-Trichloropropane	50.0			48.0	ug/L		96	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0			48.9	ug/L		97.9	(70%-130%)			
1,2-Dibromoethane	50.0			49.1	ug/L		98.3	(70%-130%)			
1,2-Dichloroethane	50.0			47.7	ug/L		95.4	(70%-130%)			
1,2-Dichloropropane	50.0			47.0	ug/L		93.9	(70%-130%)			
2-Butanone	250			260	ug/L		104	(70%-130%)			
2-Hexanone	250			298	ug/L		119	(70%-130%)			
4-Methyl-2-pentanone	250			221	ug/L		88.6	(70%-130%)			
Acetone	250			233	ug/L		93.3	(70%-130%)			
Acetonitrile	1250			999	ug/L		79.9	(70%-130%)			
Benzene	50.0			45.3	ug/L		90.7	(70%-130%)			
Bromoform	50.0			60.4	ug/L		121	(70%-130%)			
Carbon disulfide	250			233	ug/L		93.3	(70%-130%)			
Carbon tetrachloride	50.0			52.2	ug/L		104	(70%-130%)			

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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1387956										
Chlorobenzene	50.0			47.3	ug/L		94.5	(70%-130%)	CDS1	05/14/14 07:50
Chloroethane	50.0			45.2	ug/L		90.3	(70%-130%)		
Chloroform	50.0			47.0	ug/L		94	(70%-130%)		
Dibromochloromethane	50.0			52.3	ug/L		105	(70%-130%)		
Dibromomethane	50.0			49.4	ug/L		98.7	(70%-130%)		
Dichlorodifluoromethane	50.0			58.3	ug/L		117	(70%-130%)		
Ethylbenzene	50.0			47.3	ug/L		94.5	(70%-130%)		
Iodomethane	250			241	ug/L		96.3	(70%-130%)		
Methylene chloride	50.0			40.5	ug/L		81	(70%-130%)		
Styrene	50.0			50.4	ug/L		101	(70%-130%)		
Tetrachloroethylene	50.0			48.6	ug/L		97.2	(70%-130%)		
Toluene	50.0			45.3	ug/L		90.7	(70%-130%)		
Trichloroethene	50.0			49.5	ug/L		98.9	(70%-130%)		
Vinyl acetate	250			246	ug/L		98.6	(70%-130%)		
Vinyl chloride	50.0			42.4	ug/L		84.8	(70%-130%)		
Xylenes (total)	150			140	ug/L		93	(70%-130%)		
cis-1,3-Dichloropropylene	50.0			53.2	ug/L		106	(70%-130%)		
trans-1,2-Dichloroethylene	50.0			43.3	ug/L		86.5	(70%-130%)		
trans-1,3-Dichloropropylene	50.0			50.2	ug/L		100	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			47.4	ug/L		94.7	(78%-124%)		
**Bromofluorobenzene	50.0			53.2	ug/L		106	(80%-120%)		

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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1387956											
**Toluene-d8	50.0			47.4	ug/L		94.8	(80%-120%)			
QC1203088530 LCS											
2-Chloro-1,3-butadiene	50.0			55.3	ug/L		111	(70%-130%)	CDS1	05/14/14	09:20
Acrolein	250			260	ug/L		104	(70%-130%)			
Acrylonitrile	250			199	ug/L		79.8	(70%-130%)			
Allyl chloride	250			226	ug/L		90.6	(70%-130%)			
Ethyl methacrylate	250			228	ug/L		91.1	(70%-130%)			
Isobutyl alcohol	2500			2270	ug/L		90.8	(70%-130%)			
Methacrylonitrile	250			234	ug/L		93.8	(70%-130%)			
trans-1,4-Dichloro-2-butene	250			257	ug/L		103	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			47.8	ug/L		95.7	(78%-124%)			
**Bromofluorobenzene	50.0			52.7	ug/L		105	(80%-120%)			
**Toluene-d8	50.0			47.2	ug/L		94.5	(80%-120%)			
QC1203089346 LCS											
1,1,1,2-Tetrachloroethane	50.0			46.6	ug/L		93.2	(70%-130%)		05/15/14	07:38
1,1,1-Trichloroethane	50.0			50.4	ug/L		101	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0			45.9	ug/L		91.8	(70%-130%)			
1,1,2-Trichloroethane	50.0			45.2	ug/L		90.4	(70%-130%)			
1,1-Dichloroethane	50.0			44.6	ug/L		89.3	(70%-130%)			
1,1-Dichloroethylene	50.0			46.4	ug/L		92.9	(70%-130%)			
1,2,3-Trichloropropane	50.0			45.7	ug/L		91.3	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0			45.2	ug/L		90.3	(70%-130%)			
1,2-Dibromoethane	50.0			47.6	ug/L		95.2	(70%-130%)			
1,2-Dichloroethane	50.0			46.1	ug/L		92.2	(70%-130%)			

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

QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1387956										
1,2-Dichloropropane	50.0			46.5	ug/L		93.1	(70%-130%)	CDS1	05/15/14 07:38
2-Butanone	250			255	ug/L		102	(70%-130%)		
2-Hexanone	250			291	ug/L		116	(70%-130%)		
4-Methyl-2-pentanone	250			214	ug/L		85.8	(70%-130%)		
Acetone	250			235	ug/L		93.9	(70%-130%)		
Acetonitrile	1250			967	ug/L		77.4	(70%-130%)		
Benzene	50.0			44.9	ug/L		89.7	(70%-130%)		
Bromoform	50.0			56.3	ug/L		113	(70%-130%)		
Carbon disulfide	250			235	ug/L		94.2	(70%-130%)		
Carbon tetrachloride	50.0			51.9	ug/L		104	(70%-130%)		
Chlorobenzene	50.0			46.7	ug/L		93.4	(70%-130%)		
Chloroethane	50.0			47.4	ug/L		94.9	(70%-130%)		
Chloroform	50.0			46.9	ug/L		93.8	(70%-130%)		
Dibromochloromethane	50.0			50.5	ug/L		101	(70%-130%)		
Dibromomethane	50.0			47.4	ug/L		94.8	(70%-130%)		
Dichlorodifluoromethane	50.0			60.0	ug/L		120	(70%-130%)		
Ethylbenzene	50.0			46.8	ug/L		93.5	(70%-130%)		
Iodomethane	250			241	ug/L		96.4	(70%-130%)		
Methylene chloride	50.0			40.7	ug/L		81.4	(70%-130%)		
Styrene	50.0			50.2	ug/L		100	(70%-130%)		
Tetrachloroethylene	50.0			47.8	ug/L		95.7	(70%-130%)		

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GEL LABORATORIES LLC
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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1387956										
Toluene	50.0			44.7	ug/L		89.3	(70%-130%)		
Trichloroethene	50.0			48.5	ug/L		97	(70%-130%)	CDS1	05/15/14 07:38
Vinyl acetate	250			235	ug/L		93.8	(70%-130%)		
Vinyl chloride	50.0			45.6	ug/L		91.2	(70%-130%)		
Xylenes (total)	150			138	ug/L		92	(70%-130%)		
cis-1,3-Dichloropropylene	50.0			51.7	ug/L		103	(70%-130%)		
trans-1,2-Dichloroethylene	50.0			44.3	ug/L		88.6	(70%-130%)		
trans-1,3-Dichloropropylene	50.0			48.2	ug/L		96.3	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			47.3	ug/L		94.7	(78%-124%)		
**Bromofluorobenzene	50.0			52.6	ug/L		105	(80%-120%)		
**Toluene-d8	50.0			47.5	ug/L		95.1	(80%-120%)		
QC1203089347 LCS										
2-Chloro-1,3-butadiene	50.0			70.7	ug/L		141*	(70%-130%)		05/15/14 08:46
Acrolein	250			245	ug/L		97.8	(70%-130%)		
Acrylonitrile	250			228	ug/L		91.1	(70%-130%)		
Allyl chloride	250			267	ug/L		107	(70%-130%)		
Ethyl methacrylate	250			246	ug/L		98.6	(70%-130%)		
Isobutyl alcohol	2500			2480	ug/L		99.1	(70%-130%)		
Methacrylonitrile	250			262	ug/L		105	(70%-130%)		
trans-1,4-Dichloro-2-butene	250			277	ug/L		111	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			48.2	ug/L		96.4	(78%-124%)		
**Bromofluorobenzene	50.0			54.3	ug/L		109	(80%-120%)		
**Toluene-d8	50.0			46.5	ug/L		92.9	(80%-120%)		

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GEL LABORATORIES LLC
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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1387956											
QC1203088526 MB											
1,1,1,2-Tetrachloroethane			U	ND	ug/L				CDS1	05/14/14	09:50
1,1,1-Trichloroethane			U	ND	ug/L						
1,1,2,2-Tetrachloroethane			U	ND	ug/L						
1,1,2-Trichloroethane			U	ND	ug/L						
1,1-Dichloroethane			U	ND	ug/L						
1,1-Dichloroethylene			U	ND	ug/L						
1,2,3-Trichloropropane			U	ND	ug/L						
1,2-Dibromo-3-chloropropane			U	ND	ug/L						
1,2-Dibromoethane			U	ND	ug/L						
1,2-Dichloroethane			U	ND	ug/L						
1,2-Dichloropropane			U	ND	ug/L						
2-Butanone			U	ND	ug/L						
2-Chloro-1,3-butadiene			U	ND	ug/L						
2-Hexanone			U	ND	ug/L						
4-Methyl-2-pentanone			U	ND	ug/L						
Acetone			U	ND	ug/L						
Acetonitrile			U	ND	ug/L						
Acrolein			U	ND	ug/L						
Acrylonitrile			U	ND	ug/L						
Allyl chloride			U	ND	ug/L						
Benzene			U	ND	ug/L						

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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1387956											
Bromoform			U	ND	ug/L				CDS1	05/14/14	09:50
Carbon disulfide			U	ND	ug/L						
Carbon tetrachloride			U	ND	ug/L						
Chlorobenzene			U	ND	ug/L						
Chloroethane			U	ND	ug/L						
Chloroform			U	ND	ug/L						
Dibromochloromethane			U	ND	ug/L						
Dibromomethane			U	ND	ug/L						
Dichlorodifluoromethane			U	ND	ug/L						
Ethyl methacrylate			U	ND	ug/L						
Ethylbenzene			U	ND	ug/L						
Iodomethane			U	ND	ug/L						
Isobutyl alcohol			U	ND	ug/L						
Methacrylonitrile			U	ND	ug/L						
Methylene chloride			U	ND	ug/L						
Styrene			U	ND	ug/L						
Tetrachloroethylene			U	ND	ug/L						
Toluene			U	ND	ug/L						
Trichloroethene			U	ND	ug/L						
Vinyl acetate			U	ND	ug/L						
Vinyl chloride			U	ND	ug/L						

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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1387956										
Xylenes (total)			U	ND	ug/L					
cis-1,3-Dichloropropylene			U	ND	ug/L				CDS1	05/14/14 09:50
trans-1,2-Dichloroethylene			U	ND	ug/L					
trans-1,3-Dichloropropylene			U	ND	ug/L					
trans-1,4-Dichloro-2-butene			U	ND	ug/L					
**1,2-Dichloroethane-d4	50.0			48.7	ug/L		97.3	(78%-124%)		
**Bromofluorobenzene	50.0			52.3	ug/L		105	(80%-120%)		
**Toluene-d8	50.0			47.4	ug/L		94.8	(80%-120%)		
QC1203089345 MB										
1,1,1,2-Tetrachloroethane			U	ND	ug/L					05/15/14 09:16
1,1,1-Trichloroethane			U	ND	ug/L					
1,1,2,2-Tetrachloroethane			U	ND	ug/L					
1,1,2-Trichloroethane			U	ND	ug/L					
1,1-Dichloroethane			U	ND	ug/L					
1,1-Dichloroethylene			U	ND	ug/L					
1,2,3-Trichloropropane			U	ND	ug/L					
1,2-Dibromo-3-chloropropane			U	ND	ug/L					
1,2-Dibromoethane			U	ND	ug/L					
1,2-Dichloroethane			U	ND	ug/L					
1,2-Dichloropropane			U	ND	ug/L					
2-Butanone			U	ND	ug/L					
2-Chloro-1,3-butadiene			U	ND	ug/L					
2-Hexanone			U	ND	ug/L					

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QC Summary

Workorder: 348658

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1387956											
4-Methyl-2-pentanone			U	ND	ug/L				CDS1	05/15/14	09:16
Acetone			U	ND	ug/L						
Acetonitrile			U	ND	ug/L						
Acrolein			U	ND	ug/L						
Acrylonitrile			U	ND	ug/L						
Allyl chloride			U	ND	ug/L						
Benzene			U	ND	ug/L						
Bromoform			U	ND	ug/L						
Carbon disulfide			U	ND	ug/L						
Carbon tetrachloride			U	ND	ug/L						
Chlorobenzene			U	ND	ug/L						
Chloroethane			U	ND	ug/L						
Chloroform			U	ND	ug/L						
Dibromochloromethane			U	ND	ug/L						
Dibromomethane			U	ND	ug/L						
Dichlorodifluoromethane			U	ND	ug/L						
Ethyl methacrylate			U	ND	ug/L						
Ethylbenzene			U	ND	ug/L						
Iodomethane			U	ND	ug/L						
Isobutyl alcohol			U	ND	ug/L						
Methacrylonitrile			U	ND	ug/L						

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QC Summary

Workorder: **348658**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1387956										
Methylene chloride			U	ND	ug/L					
Styrene			U	ND	ug/L				CDS1	05/15/14 09:16
Tetrachloroethylene			U	ND	ug/L					
Toluene			U	ND	ug/L					
Trichloroethene			U	ND	ug/L					
Vinyl acetate			U	ND	ug/L					
Vinyl chloride			U	ND	ug/L					
Xylenes (total)			U	ND	ug/L					
cis-1,3-Dichloropropylene			U	ND	ug/L					
trans-1,2-Dichloroethylene			U	ND	ug/L					
trans-1,3-Dichloropropylene			U	ND	ug/L					
trans-1,4-Dichloro-2-butene			U	ND	ug/L					
**1,2-Dichloroethane-d4	50.0			48.4	ug/L		96.8	(78%-124%)		
**Bromofluorobenzene	50.0			52.4	ug/L		105	(80%-120%)		
**Toluene-d8	50.0			48.1	ug/L		96.2	(80%-120%)		
QC1203088531 348558001 PS										
1,1,1,2-Tetrachloroethane	50.0	U	ND	50.2	ug/L		100	(70%-130%)		05/14/14 14:16
1,1,1-Trichloroethane	50.0	U	ND	51.7	ug/L		103	(70%-130%)		
1,1,2,2-Tetrachloroethane	50.0	U	ND	45.9	ug/L		91.7	(70%-130%)		
1,1,2-Trichloroethane	50.0	U	ND	46.7	ug/L		93.4	(70%-130%)		
1,1-Dichloroethane	50.0	U	ND	45.7	ug/L		91.4	(70%-130%)		
1,1-Dichloroethylene	50.0	U	ND	47.4	ug/L		94.8	(70%-130%)		
1,2,3-Trichloropropane	50.0	U	ND	45.4	ug/L		90.9	(70%-130%)		

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QC Summary

Workorder: **348658**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1387956											
1,2-Dibromo-3-chloropropane	50.0	U	ND		46.1	ug/L		92.2	(70%-130%)	CDS1	05/14/14 14:16
1,2-Dibromoethane	50.0	U	ND		47.5	ug/L		94.9	(70%-130%)		
1,2-Dichloroethane	50.0	U	ND		46.5	ug/L		92.9	(70%-130%)		
1,2-Dichloropropane	50.0	U	ND		47.1	ug/L		94.2	(70%-130%)		
2-Butanone	250	TU	ND	T	168	ug/L		67.2*	(70%-130%)		
2-Hexanone	250	U	ND		199	ug/L		79.5	(70%-130%)		
4-Methyl-2-pentanone	250	U	ND		214	ug/L		85.5	(70%-130%)		
Acetone	250	TU	ND	T	127	ug/L		50.7*	(70%-130%)		
Acetonitrile	1250	U	ND		992	ug/L		79.4	(70%-130%)		
Benzene	50.0	U	ND		47.1	ug/L		94.1	(70%-130%)		
Bromoform	50.0	U	ND		54.8	ug/L		110	(70%-130%)		
Carbon disulfide	250	U	ND		248	ug/L		99.2	(70%-130%)		
Carbon tetrachloride	50.0		16.2		68.6	ug/L		105	(70%-130%)		
Chlorobenzene	50.0	U	ND		48.7	ug/L		97.4	(70%-130%)		
Chloroethane	50.0	U	ND		48.5	ug/L		97	(70%-130%)		
Chloroform	50.0	J	2.17		49.5	ug/L		94.6	(70%-130%)		
Dibromochloromethane	50.0	U	ND		51.0	ug/L		102	(70%-130%)		
Dibromomethane	50.0	U	ND		48.4	ug/L		96.7	(70%-130%)		
Dichlorodifluoromethane	50.0	U	ND		60.8	ug/L		122	(70%-130%)		
Ethylbenzene	50.0	U	ND		49.8	ug/L		99.7	(70%-130%)		
Iodomethane	250	U	ND		243	ug/L		97.1	(70%-130%)		

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QC Summary

Workorder: **348658**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1387956											
Methylene chloride	50.0	U	ND		41.9	ug/L		83.9	(70%-130%)		
Styrene	50.0	U	ND		52.0	ug/L		104	(70%-130%)	CDS1	05/14/14 14:16
Tetrachloroethylene	50.0	U	ND		51.1	ug/L		102	(70%-130%)		
Toluene	50.0	U	ND		48.4	ug/L		96.8	(70%-130%)		
Trichloroethene	50.0	J	4.00		54.3	ug/L		101	(70%-130%)		
Vinyl acetate	250	U	ND		240	ug/L		95.8	(70%-130%)		
Vinyl chloride	50.0	U	ND		45.8	ug/L		91.5	(70%-130%)		
Xylenes (total)	150	U	ND		149	ug/L		99	(70%-130%)		
cis-1,3-Dichloropropylene	50.0	U	ND		49.3	ug/L		98.6	(70%-130%)		
trans-1,2-Dichloroethylene	50.0	U	ND		45.7	ug/L		91.3	(70%-130%)		
trans-1,3-Dichloropropylene	50.0	U	ND		48.7	ug/L		97.5	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		47.6		46.9	ug/L		93.7	(78%-124%)		
**Bromofluorobenzene	50.0		54.9		51.1	ug/L		102	(80%-120%)		
**Toluene-d8	50.0		48.6		48.8	ug/L		97.5	(80%-120%)		
QC1203088873 348558001 PS											
2-Chloro-1,3-butadiene	50.0	TU	ND	T	72.7	ug/L		145*	(70%-130%)		05/14/14 15:16
Acrolein	250	U	ND		261	ug/L		105	(70%-130%)		
Acrylonitrile	250	U	ND		233	ug/L		93.3	(70%-130%)		
Allyl chloride	250	U	ND		275	ug/L		110	(70%-130%)		
Ethyl methacrylate	250	U	ND		249	ug/L		99.5	(70%-130%)		
Isobutyl alcohol	2500	U	ND		2520	ug/L		101	(70%-130%)		
Methacrylonitrile	250	U	ND		261	ug/L		105	(70%-130%)		
trans-1,4-Dichloro-2-butene	250	U	ND		286	ug/L		114	(70%-130%)		

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QC Summary

Workorder: **348658**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1387956											
**1,2-Dichloroethane-d4	50.0		47.6		47.3	ug/L		94.5	(78%-124%)	CDS1	05/14/14 15:16
**Bromofluorobenzene	50.0		54.9		54.2	ug/L		108	(80%-120%)		
**Toluene-d8	50.0		48.6		46.4	ug/L		92.7	(80%-120%)		
QC1203088532 348558001 PSD											
1,1,1,2-Tetrachloroethane	50.0	U	ND		51.4	ug/L	2.34	103	(0%-20%)		05/14/14 14:46
1,1,1-Trichloroethane	50.0	U	ND		54.3	ug/L	5.02	109	(0%-20%)		
1,1,2,2-Tetrachloroethane	50.0	U	ND		50.9	ug/L	10.4	102	(0%-20%)		
1,1,2-Trichloroethane	50.0	U	ND		49.8	ug/L	6.39	99.5	(0%-20%)		
1,1-Dichloroethane	50.0	U	ND		47.6	ug/L	4.05	95.2	(0%-20%)		
1,1-Dichloroethylene	50.0	U	ND		49.3	ug/L	3.81	98.5	(0%-20%)		
1,2,3-Trichloropropane	50.0	U	ND		49.9	ug/L	9.28	99.7	(0%-20%)		
1,2-Dibromo-3-chloropropane	50.0	U	ND		50.1	ug/L	8.25	100	(0%-20%)		
1,2-Dibromoethane	50.0	U	ND		51.7	ug/L	8.65	103	(0%-20%)		
1,2-Dichloroethane	50.0	U	ND		49.6	ug/L	6.62	99.3	(0%-20%)		
1,2-Dichloropropane	50.0	U	ND		50.1	ug/L	6.19	100	(0%-20%)		
2-Butanone	250	TU	ND		178	ug/L	5.76	71.2	(0%-20%)		
2-Hexanone	250	U	ND		212	ug/L	6.40	84.7	(0%-20%)		
4-Methyl-2-pentanone	250	U	ND		223	ug/L	4.20	89.1	(0%-20%)		
Acetone	250	TU	ND	T	135	ug/L	6.66	54.2*	(0%-20%)		
Acetonitrile	1250	U	ND		1040	ug/L	4.31	82.9	(0%-20%)		
Benzene	50.0	U	ND		48.3	ug/L	2.52	96.5	(0%-20%)		
Bromoform	50.0	U	ND		61.6	ug/L	11.7	123	(0%-20%)		

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QC Summary

Workorder: **348658**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1387956											
Carbon disulfide	250	U	ND		251	ug/L	1.09	100	(0%-20%)	CDS1	05/14/14 14:46
Carbon tetrachloride	50.0		16.2		70.3	ug/L	2.48	108	(0%-20%)		
Chlorobenzene	50.0	U	ND		50.9	ug/L	4.42	102	(0%-20%)		
Chloroethane	50.0	U	ND		47.1	ug/L	3.06	94.1	(0%-20%)		
Chloroform	50.0	J	2.17		51.7	ug/L	4.47	99.1	(0%-20%)		
Dibromochloromethane	50.0	U	ND		54.6	ug/L	6.74	109	(0%-20%)		
Dibromomethane	50.0	U	ND		51.4	ug/L	6.08	103	(0%-20%)		
Dichlorodifluoromethane	50.0	U	ND		60.6	ug/L	0.412	121	(0%-20%)		
Ethylbenzene	50.0	U	ND		51.4	ug/L	3.10	103	(0%-20%)		
Iodomethane	250	U	ND		253	ug/L	4.03	101	(0%-20%)		
Methylene chloride	50.0	U	ND		43.7	ug/L	4.18	87.5	(0%-20%)		
Styrene	50.0	U	ND		53.9	ug/L	3.49	108	(0%-20%)		
Tetrachloroethylene	50.0	U	ND		52.7	ug/L	3.08	105	(0%-20%)		
Toluene	50.0	U	ND		49.7	ug/L	2.61	99.4	(0%-20%)		
Trichloroethene	50.0	J	4.00		56.7	ug/L	4.42	105	(0%-20%)		
Vinyl acetate	250	U	ND		244	ug/L	1.66	97.4	(0%-20%)		
Vinyl chloride	50.0	U	ND		45.1	ug/L	1.50	90.2	(0%-20%)		
Xylenes (total)	150	U	ND		151	ug/L	1.76	101	(0%-20%)		
cis-1,3-Dichloropropylene	50.0	U	ND		54.4	ug/L	9.85	109	(0%-20%)		
trans-1,2-Dichloroethylene	50.0	U	ND		47.2	ug/L	3.27	94.4	(0%-20%)		
trans-1,3-Dichloropropylene	50.0	U	ND		53.0	ug/L	8.45	106	(0%-20%)		

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QC Summary

Workorder: **348658**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1387956											
**1,2-Dichloroethane-d4	50.0		47.6		47.3	ug/L		94.7	(78%-124%)		
**Bromofluorobenzene	50.0		54.9		52.5	ug/L		105	(80%-120%)	CDS1	05/14/14 14:46
**Toluene-d8	50.0		48.6		48.1	ug/L		96.2	(80%-120%)		
QC1203088874 348558001 PSD											
2-Chloro-1,3-butadiene	50.0	TU	ND	T	71.6	ug/L	1.54	143*	(0%-20%)		05/14/14 15:46
Acrolein	250	U	ND		254	ug/L	2.78	102	(0%-20%)		
Acrylonitrile	250	U	ND		234	ug/L	0.321	93.6	(0%-20%)		
Allyl chloride	250	U	ND		273	ug/L	0.824	109	(0%-20%)		
Ethyl methacrylate	250	U	ND		261	ug/L	4.97	105	(0%-20%)		
Isobutyl alcohol	2500	U	ND		2600	ug/L	3.39	104	(0%-20%)		
Methacrylonitrile	250	U	ND		270	ug/L	3.10	108	(0%-20%)		
trans-1,4-Dichloro-2-butene	250	U	ND		293	ug/L	2.61	117	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		47.6		47.6	ug/L		95.2	(78%-124%)		
**Bromofluorobenzene	50.0		54.9		53.6	ug/L		107	(80%-120%)		
**Toluene-d8	50.0		48.6		47.8	ug/L		95.6	(80%-120%)		

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.

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QC Summary

Workorder: **348658**

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

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.

Miscellaneous

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GEL Laboratories LLC
Form GEL-DER

DER Report No.: 1293696
Revision No.: 1

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
16-MAY-14	Federal	SOP	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
VOA GC/MS	8260C	Liquid	HMSA001
Batch ID:	**Sample Numbers:**		
1387956	See Below		

Potentially affected work order(s)(SDG): 348313,348558(GEL348558),348559(GEL348559),348657(GEL348657),348658(GEL348658),348682(GEL348682)

Application Issues:

Failed Recovery for MS/PS

Other

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. The percent drifts for Dichlorodifluoromethane and 2-Chloro-1,3-butadiene were above the acceptance limits in the initial calibration verification samples both with high bias. The effected SDGs are 348558 and 348658. 2. The percent drifts for Dichlorodifluoromethane, Bromoform and 2-Chloro-1,3-butadiene were above the acceptance limits in the calibration verification sample analyzed on 05/14/14 and 05/15/14. The effected SDGs are 348558 and 348658 and 348682(Bromoform only). 3. The recovery for 2-Chloro-1,3-butadiene was above the acceptance limits in LCS 1203089347. The effected SDGs is 348558. 4. The recovery for 2-Chloro-1,3-butadiene was above the acceptance limits in MS and in the MSD performed on sample 348558001. The recovery for Acetone was below the acceptance limits in the MS and in the MSD performed on this sample. The recovery for 2-Butanone was below the acceptance limits in the MS performed on this sample. The calculated relative percent differences between the MS and MSD were all within acceptance limits.	1,2. Narrate and report data. Dichlorodifluoromethane and 2-Chloro-1,3-butadiene were not detected in any of the associated samples. 3,4. Narrate and report data.

Originator's Name:

Crystal Stacey 16-MAY-14

Data Validator/Group Leader:

Erin Haubert 16-MAY-14