

June 28, 2016

REV. 1



gel.com

June 27, 2016

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

Re: CHPRC SAF I16-012
Work Order: 392416
SDG: GEL392416

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 03, 2016. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. Per change order, this package was revised to correct the Appedix IX Volatiles reporting list.

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,

A handwritten signature in cursive script that reads "Heather Shaffer".

Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: I16-012-026
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	6
Data Review Qualifier Definitions.....	9
Laboratory Certifications.....	11
Volatile Analysis.....	13
Case Narrative.....	14
Sample Data Summary.....	17
Quality Control Summary.....	20
Metals Analysis.....	33
Case Narrative.....	34
Sample Data Summary.....	37
Quality Control Summary.....	39
Radiological Analysis.....	46
Case Narrative.....	47
Sample Data Summary.....	51
Quality Control Summary.....	54

SAMPLE ISSUE RESOLUTION	SIR NUM	SIR16-474
	REV NUM	0
	DATE INITIATED	7/7/2016

SAMPLE EVENT INFORMATION

SAF NUM(S) 116-012
OPERABLE UNIT(S) 200-ZP-1
PROJECT(S) CERC16
SAMPLE EVENT TITLE(S) CERC16
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B343W4
SAMPLE MATRIX WATER
COLLECTION DATE 3/2/2016 - 3/2/2016
SDG NUM GEL392416

ISSUE BACKGROUND

CLASS Sample Management Issues
TYPE Analyte Correction

DESCRIPTION SMR discovered the 8260_VOA_GCMS_IX: COMMON service list for GEL inadvertently omitted several compounds. Omitted compounds were: Bromodichloromethane (75-27-4), bromomethane (74-83-9), ethyl cyanide (107-12-0), Methyl methacrylate (80-62-6), trichlorofluoromethane (75-69-4), cis-1,2-dichloroethene (156-59-2) and 1,4-dichlorobenzene (106-46-7).

DISPOSITION

DESCRIPTION Please add the omitted compounds.

JUSTIFICATION Final Disposition: Add the compounds and re-issue the report.

SUBMITTED BY: Doris Ayres DATE: 07/07/2016
 ACCEPTED BY: Heather Shaffer DATE: 07/07/2016

Case Narrative

Per change order, this package was revised to correct the Appendix IX Volatiles reporting list.

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF I16-012
SDG: GEL392416**

June 27, 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 March 03, 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
392416001	B343W4

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, Metals and Radiochemistry.

We certify that this package is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

June 28, 2016

Revision #1 28-JUN-2016

REV. 1

Heather Shaffer

Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL392416
Work Order #: 392416

GC/MS Volatile

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

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Sample	Analyte	Value
1203504775 (Non SDG 392283003PS)	Acetone	62* (70%-130%)
1203504776 (Non SDG 392283003PSD)	2-Butanone	69* (70%-130%)
	Acetone	56* (70%-130%)

Metals

Determination of Metals by ICP-MS

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Radiochemistry

TRITIUM_DIST_LSC: COMMON

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

TC99_EIE_LSC: COMMON

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **116-012-026**

Page 1 of 1

CH2M Hill Plateau Remediation Company

392416

Collector: Scott King
CHPRC
116-012

Contact/Requester: Karen Waters-Husted
Telephone No. 509-376-4650

Project Title: 200ZP1, FEBRUARY 2016
Sampling Origin: Hanford Site

Shipped To (Lab): GEL Laboratories, LLC
Logbook No. HNF-N-506
Purchase Order/Charge Code: 300071

Protocol: CERCLA
Method of Shipment: Commercial Carrier
Ice Chest No. CWS-515
Bill of Lading/Air Bill No. 775782961426
Offsite Property No. 6401

Priority: 30 Days **PRIORITY**

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

Total Activity Exemption: Yes No

SPECIAL INSTRUCTIONS

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B343W4	N	MAR 02 2016	1054	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B343W4	N			4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B343W4	N			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B343W4	N	MAR 02 2016	1054	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

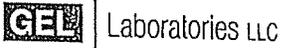
Relinquished By: <i>[Signature]</i> CHPRC	Date/Time: MAR 02 2016 1205	Received By: M.A. White CHPRC	Date/Time: MAR 02 2016 1205	Sign: <i>[Signature]</i>
Relinquished By: M.A. White CHPRC	Date/Time: MAR 02 2016 1400	Received By: FEDEX	Date/Time: MAR 02 2016 0905	Sign: <i>[Signature]</i>
Relinquished By: FEDEX	Date/Time: MAR 02 2016 1400	Received By: <i>[Signature]</i>	Date/Time: MAR 02 2016 0905	Sign: <i>[Signature]</i>

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By: *[Signature]*

Date/Time: _____

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



SAMPLE RECEIPT & REVIEW FORM

Client: CDRC		SDG/AR/COC/Work Order: 392416	
Received By: JAS		Date Received: 03/03/16	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive I or III by RSO?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	<input 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"/>	<input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	<input 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"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bag</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 2°C, 1°C
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 201464337
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>			If Preservation added, Lot#: _____ Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>			(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected: B34295 - one vial with headspace
9 Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected: Lab rec'd vials ID B34295 not on any C.O.C
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
16 Carrier and tracking number.				Circle Applicable: FedEx <u>Air</u> FedEx Ground UPS Field Services Courier Other 7757 8296 0739-2° 7757 8296 1426-2° 7757 8296 1312-2° 7757 7745 9170-1°

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

GEL LABORATORIES LLC

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

Report Date: 27-JUN-16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Revision #1 28-JUN-2016

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

Laboratory Certifications

List of current GEL Certifications as of 27 June 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 #: GEL392416
 Work Order #: 392416**

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

Analytical Method: SW846 8260C

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

Analytical Batch: 1550896

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
392416001	B343W4
1203504773	Method Blank (MB)
1203504774	Laboratory Control Sample (LCS)
1203504775	392283003(NonSDG) Post Spike (PS)
1203504776	392283003(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
1203504775 (Non SDG 392283003PS)	Acetone	62* (70%-130%)
1203504776 (Non SDG 392283003PSD)	2-Butanone	69* (70%-130%)
	Acetone	56* (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: GEL392416 GEL Work Order: 392416

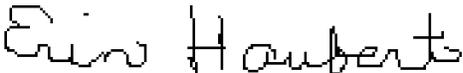
The Qualifiers in this report are defined as follows:

- 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 MAR 2016

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 2

SDG Number: GEL392416	Date Collected: 03/02/2016 10:54	Matrix: WATER
Lab Sample ID: 392416001	Date Received: 03/03/2016 09:05	
Client ID: B343W4	Client: CPRC001	Project: CPRC0116012
Batch ID: 1550896	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/09/2016 13:37	Inst: VOA3.I	Dilution: 1
Prep Date: 03/09/2016 13:37	Analyst: CDS1	Purge Vol: 5 mL
Data File: 030916V3\3Z310.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	2.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	2.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	2.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	2.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	2.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	2.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	2.00
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	2.00
591-78-6	2-Hexanone	U	3.00	ug/L	3.00	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0
75-05-8	Acetonitrile	U	16.7	ug/L	16.7	50.0
107-02-8	Acrolein	U	3.00	ug/L	3.00	10.0
107-13-1	Acrylonitrile	U	3.00	ug/L	3.00	10.0
107-05-1	Allyl chloride	U	3.00	ug/L	3.00	10.0
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	2.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	2.00
74-83-9	Bromomethane	U	0.300	ug/L	0.300	2.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	2.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	2.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	2.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	2.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	2.00
97-63-2	Ethyl methacrylate	U	3.00	ug/L	3.00	10.0
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00
74-88-4	Iodomethane	U	3.00	ug/L	3.00	10.0
78-83-1	Isobutyl alcohol	U	33.0	ug/L	33.0	100

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 2

SDG Number: GEL392416	Date Collected: 03/02/2016 10:54	Matrix: WATER
Lab Sample ID: 392416001	Date Received: 03/03/2016 09:05	
Client ID: B343W4	Client: CPRC001	Project: CPRC0116012
Batch ID: 1550896	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 03/09/2016 13:37	Inst: VOA3.I	Dilution: 1
Prep Date: 03/09/2016 13:37	Analyst: CDS1	Purge Vol: 5 mL
Data File: 030916V3\3Z310.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
126-98-7	Methacrylonitrile	U	3.00	ug/L	3.00	10.0
80-62-6	Methyl methacrylate	U	3.00	ug/L	3.00	10.0
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00
107-12-0	Propionitrile	U	3.00	ug/L	3.00	10.0
100-42-5	Styrene	U	0.300	ug/L	0.300	2.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	2.00
108-05-4	Vinyl acetate	U	1.60	ug/L	1.60	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	2.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	2.00
110-57-6	trans-1,4-Dichloro-2-butene	U	1.50	ug/L	1.50	10.0

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 27, 2016

Page 1 of 11

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 392416

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
QC1203504774	LCS										
1,1,1,2-Tetrachloroethane	50.0			51.8	ug/L		104	(70%-130%)	CDS1	03/09/16	09:25
1,1,1-Trichloroethane	50.0			59.9	ug/L		120	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0			52.2	ug/L		104	(70%-130%)			
1,1,2-Trichloroethane	50.0			50.5	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0			56.9	ug/L		114	(70%-130%)			
1,1-Dichloroethylene	50.0			58.9	ug/L		118	(70%-130%)			
1,2,3-Trichloropropane	50.0			49.6	ug/L		99	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0			56.2	ug/L		112	(70%-130%)			
1,2-Dibromoethane	50.0			49.5	ug/L		99	(70%-130%)			
1,2-Dichloroethane	50.0			49.3	ug/L		99	(70%-130%)			
1,2-Dichloropropane	50.0			52.9	ug/L		106	(70%-130%)			
1,4-Dichlorobenzene	50.0			54.3	ug/L		109	(70%-130%)			
2-Butanone	250			245	ug/L		98	(70%-130%)			
2-Hexanone	250			261	ug/L		105	(70%-130%)			
4-Methyl-2-pentanone	250			222	ug/L		89	(70%-130%)			
Acetone	250			236	ug/L		94	(70%-130%)			
Acetonitrile	1250			1070	ug/L		86	(70%-130%)			
Benzene	50.0			55.4	ug/L		111	(70%-130%)			
Bromodichloromethane	50.0			55.3	ug/L		111	(70%-130%)			
Bromoform	50.0			58.0	ug/L		116	(70%-130%)			

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QC Summary

Workorder: 392416

Page 2 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
Bromomethane	50.0			45.3	ug/L		91	(70%-130%)	CDS1	03/09/16	09:25
Carbon disulfide	250			282	ug/L		113	(70%-130%)			
Carbon tetrachloride	50.0			58.3	ug/L		117	(70%-130%)			
Chlorobenzene	50.0			55.0	ug/L		110	(70%-130%)			
Chloroethane	50.0			48.9	ug/L		98	(70%-130%)			
Chloroform	50.0			53.1	ug/L		106	(70%-130%)			
Chloromethane	50.0			42.5	ug/L		85	(70%-130%)			
Dibromochloromethane	50.0			54.9	ug/L		110	(70%-130%)			
Dibromomethane	50.0			52.7	ug/L		105	(70%-130%)			
Dichlorodifluoromethane	50.0			49.2	ug/L		98	(70%-130%)			
Ethylbenzene	50.0			52.6	ug/L		105	(70%-130%)			
Iodomethane	250			267	ug/L		107	(70%-130%)			
Methylene chloride	50.0			53.0	ug/L		106	(70%-130%)			
Styrene	50.0			52.1	ug/L		104	(70%-130%)			
Tetrachloroethylene	50.0			55.2	ug/L		110	(70%-130%)			
Toluene	50.0			56.9	ug/L		114	(70%-130%)			
Trichloroethylene	50.0			58.9	ug/L		118	(70%-130%)			
Trichlorofluoromethane	50.0			48.3	ug/L		97	(70%-130%)			
Vinyl acetate	250			208	ug/L		83	(70%-130%)			
Vinyl chloride	50.0			44.0	ug/L		88	(70%-130%)			
Xylenes (total)	150			158	ug/L		105	(70%-130%)			

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

QC Summary

Workorder: 392416

Page 3 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
cis-1,2-Dichloroethylene	50.0			52.6	ug/L		105	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			55.9	ug/L		112	(70%-130%)	CDS1	03/09/16	09:25
trans-1,2-Dichloroethylene	50.0			56.1	ug/L		112	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			56.7	ug/L		113	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			46.6	ug/L		93	(70%-130%)			
**Bromofluorobenzene	50.0			50.4	ug/L		101	(70%-130%)			
**Toluene-d8	50.0			49.9	ug/L		100	(70%-130%)			
QC1203504773 MB											
1,1,1,2-Tetrachloroethane			U	0.300	ug/L					03/09/16	11:04
1,1,1-Trichloroethane			U	0.300	ug/L						
1,1,2,2-Tetrachloroethane			U	0.300	ug/L						
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						
1,2,3-Trichloropropane			U	0.300	ug/L						
1,2-Dibromo-3-chloropropane			U	0.500	ug/L						
1,2-Dibromoethane			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
1,2-Dichloropropane			U	0.300	ug/L						
1,4-Dichlorobenzene			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
2-Chloro-1,3-butadiene			U	0.300	ug/L						
2-Hexanone			U	3.00	ug/L						

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QC Summary

Workorder: 392416

Page 4 of 11

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch											1550896
4-Methyl-2-pentanone			U	3.00	ug/L				CDS1	03/09/16	11:04
Acetone			U	3.00	ug/L						
Acetonitrile			U	16.7	ug/L						
Acrolein			U	3.00	ug/L						
Acrylonitrile			U	3.00	ug/L						
Allyl chloride			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Bromodichloromethane			U	0.300	ug/L						
Bromoform			U	0.300	ug/L						
Bromomethane			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						
Chloroethane			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Chloromethane			U	0.300	ug/L						
Dibromochloromethane			U	0.300	ug/L						
Dibromomethane			U	0.300	ug/L						
Dichlorodifluoromethane			U	0.300	ug/L						
Ethyl methacrylate			U	3.00	ug/L						
Ethylbenzene			U	0.300	ug/L						

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QC Summary

Workorder: 392416

Page 5 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
Iodomethane			U	3.00	ug/L						
Isobutyl alcohol			U	33.0	ug/L				CDS1	03/09/16	11:04
Methacrylonitrile			U	3.00	ug/L						
Methyl methacrylate			U	3.00	ug/L						
Methylene chloride			U	1.60	ug/L						
Propionitrile			U	3.00	ug/L						
Styrene			U	0.300	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Trichlorofluoromethane			U	0.300	ug/L						
Vinyl acetate			U	1.60	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,2-Dichloroethylene			U	0.300	ug/L						
cis-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
trans-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,4-Dichloro-2-butene			U	1.50	ug/L						
**1,2-Dichloroethane-d4	50.0			51.0	ug/L		102	(70%-130%)			
**Bromofluorobenzene	50.0			46.2	ug/L		92	(70%-130%)			
**Toluene-d8	50.0			52.5	ug/L		105	(70%-130%)			

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QC Summary

Workorder: 392416

Page 6 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
	QC1203504775 392283003 PS										
1,1,1,2-Tetrachloroethane	50.0	U	0.00		53.7	ug/L		107 (70%-130%)	CDS1	03/09/16	19:40
1,1,1-Trichloroethane	50.0	U	0.00		62.6	ug/L		125 (70%-130%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00		53.9	ug/L		108 (70%-130%)			
1,1,2-Trichloroethane	50.0	U	0.00		51.1	ug/L		102 (70%-130%)			
1,1-Dichloroethane	50.0	U	0.00		56.8	ug/L		114 (70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00		59.6	ug/L		119 (70%-130%)			
1,2,3-Trichloropropane	50.0	U	0.00		49.7	ug/L		99 (70%-130%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00		59.1	ug/L		118 (70%-130%)			
1,2-Dibromoethane	50.0	U	0.00		52.8	ug/L		106 (70%-130%)			
1,2-Dichloroethane	50.0	U	0.00		51.9	ug/L		104 (70%-130%)			
1,2-Dichloropropane	50.0	U	0.00		54.1	ug/L		108 (70%-130%)			
1,4-Dichlorobenzene	50.0	U	0.00		52.1	ug/L		104 (70%-130%)			
2-Butanone	250	TU	0.00		197	ug/L		79 (70%-130%)			
2-Hexanone	250	U	0.00		197	ug/L		79 (70%-130%)			
4-Methyl-2-pentanone	250	U	0.00		247	ug/L		99 (70%-130%)			
Acetone	250	TU	0.00	T	156	ug/L		62* (70%-130%)			
Acetonitrile	1250	U	0.00		1210	ug/L		96 (70%-130%)			
Benzene	50.0	U	0.00		55.0	ug/L		110 (70%-130%)			
Bromodichloromethane	50.0	U	0.00		56.7	ug/L		113 (70%-130%)			
Bromoform	50.0	U	0.00		57.6	ug/L		115 (70%-130%)			
Bromomethane	50.0	U	0.00		51.3	ug/L		103 (70%-130%)			
Carbon disulfide	250	U	0.00		280	ug/L		112 (70%-130%)			

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QC Summary

Workorder: 392416

Page 7 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
Carbon tetrachloride	50.0	U	0.00	58.9	ug/L		118	(70%-130%)	CDS1	03/09/16	19:40
Chlorobenzene	50.0	U	0.00	54.4	ug/L		109	(70%-130%)			
Chloroethane	50.0	U	0.00	53.7	ug/L		107	(70%-130%)			
Chloroform	50.0	U	0.00	54.0	ug/L		108	(70%-130%)			
Chloromethane	50.0	U	0.00	49.8	ug/L		100	(70%-130%)			
Dibromochloromethane	50.0	U	0.00	56.1	ug/L		112	(70%-130%)			
Dibromomethane	50.0	U	0.00	52.9	ug/L		106	(70%-130%)			
Dichlorodifluoromethane	50.0	U	0.00	54.2	ug/L		108	(70%-130%)			
Ethylbenzene	50.0	U	0.00	54.4	ug/L		109	(70%-130%)			
Iodomethane	250	U	0.00	263	ug/L		105	(70%-130%)			
Methylene chloride	50.0	U	0.00	52.7	ug/L		105	(70%-130%)			
Styrene	50.0	U	0.00	50.8	ug/L		102	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	56.8	ug/L		114	(70%-130%)			
Toluene	50.0	U	0.00	55.3	ug/L		111	(70%-130%)			
Trichloroethylene	50.0	U	0.00	57.9	ug/L		116	(70%-130%)			
Trichlorofluoromethane	50.0	U	0.00	52.9	ug/L		106	(70%-130%)			
Vinyl acetate	250	U	0.00	228	ug/L		91	(70%-130%)			
Vinyl chloride	50.0	U	0.00	48.2	ug/L		96	(70%-130%)			
Xylenes (total)	150	U	0.00	158	ug/L		105	(70%-130%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	53.1	ug/L		106	(70%-130%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	57.8	ug/L		116	(70%-130%)			

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

QC Summary

Workorder: 392416

Page 8 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
trans-1,2-Dichloroethylene	50.0	U	0.00	55.9	ug/L		112	(70%-130%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	53.7	ug/L		107	(70%-130%)	CDS1	03/09/16	19:40
**1,2-Dichloroethane-d4	50.0		52.2	49.8	ug/L		100	(70%-130%)			
**Bromofluorobenzene	50.0		45.2	48.9	ug/L		98	(70%-130%)			
**Toluene-d8	50.0		54.4	49.4	ug/L		99	(70%-130%)			
QC1203504776 392283003 PSD											
1,1,1,2-Tetrachloroethane	50.0	U	0.00	52.4	ug/L	3	105	(0%-20%)		03/09/16	20:11
1,1,1-Trichloroethane	50.0	U	0.00	62.8	ug/L	0	126	(0%-20%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00	51.3	ug/L	5	103	(0%-20%)			
1,1,2-Trichloroethane	50.0	U	0.00	50.5	ug/L	1	101	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	57.0	ug/L	0	114	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	57.8	ug/L	3	116	(0%-20%)			
1,2,3-Trichloropropane	50.0	U	0.00	47.5	ug/L	5	95	(0%-20%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00	52.9	ug/L	11	106	(0%-20%)			
1,2-Dibromoethane	50.0	U	0.00	49.4	ug/L	7	99	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	50.7	ug/L	2	101	(0%-20%)			
1,2-Dichloropropane	50.0	U	0.00	54.5	ug/L	1	109	(0%-20%)			
1,4-Dichlorobenzene	50.0	U	0.00	50.9	ug/L	2	102	(0%-20%)			
2-Butanone	250	TU	0.00	T	172	ug/L	13	69*	(0%-20%)		
2-Hexanone	250	U	0.00	177	ug/L	10	71	(0%-20%)			
4-Methyl-2-pentanone	250	U	0.00	222	ug/L	11	89	(0%-20%)			
Acetone	250	TU	0.00	T	139	ug/L	11	56*	(0%-20%)		
Acetonitrile	1250	U	0.00	1080	ug/L	11	87	(0%-20%)			

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

QC Summary

Workorder: 392416

Page 9 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
Benzene	50.0	U	0.00	54.5	ug/L	1	109	(0%-20%)	CDS1	03/09/16	20:11
Bromodichloromethane	50.0	U	0.00	56.0	ug/L	1	112	(0%-20%)			
Bromoform	50.0	U	0.00	55.8	ug/L	3	112	(0%-20%)			
Bromomethane	50.0	U	0.00	48.6	ug/L	5	97	(0%-20%)			
Carbon disulfide	250	U	0.00	269	ug/L	4	108	(0%-20%)			
Carbon tetrachloride	50.0	U	0.00	56.9	ug/L	4	114	(0%-20%)			
Chlorobenzene	50.0	U	0.00	53.3	ug/L	2	107	(0%-20%)			
Chloroethane	50.0	U	0.00	49.9	ug/L	7	100	(0%-20%)			
Chloroform	50.0	U	0.00	54.7	ug/L	1	109	(0%-20%)			
Chloromethane	50.0	U	0.00	45.9	ug/L	8	92	(0%-20%)			
Dibromochloromethane	50.0	U	0.00	53.8	ug/L	4	108	(0%-20%)			
Dibromomethane	50.0	U	0.00	52.6	ug/L	0	105	(0%-20%)			
Dichlorodifluoromethane	50.0	U	0.00	51.4	ug/L	5	103	(0%-20%)			
Ethylbenzene	50.0	U	0.00	52.8	ug/L	3	106	(0%-20%)			
Iodomethane	250	U	0.00	258	ug/L	2	103	(0%-20%)			
Methylene chloride	50.0	U	0.00	51.3	ug/L	3	103	(0%-20%)			
Styrene	50.0	U	0.00	51.2	ug/L	1	102	(0%-20%)			
Tetrachloroethylene	50.0	U	0.00	54.1	ug/L	5	108	(0%-20%)			
Toluene	50.0	U	0.00	54.9	ug/L	1	110	(0%-20%)			
Trichloroethylene	50.0	U	0.00	56.5	ug/L	2	113	(0%-20%)			
Trichlorofluoromethane	50.0	U	0.00	50.1	ug/L	5	100	(0%-20%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 392416

Page 10 of 11

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1550896										
Vinyl acetate	250	U	0.00	202	ug/L	12	81	(0%-20%)			
Vinyl chloride	50.0	U	0.00	47.1	ug/L	2	94	(0%-20%)	CDS1	03/09/16	20:11
Xylenes (total)	150	U	0.00	153	ug/L	3	102	(0%-20%)			
cis-1,2-Dichloroethylene	50.0	U	0.00	53.1	ug/L	0	106	(0%-20%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	56.3	ug/L	3	113	(0%-20%)			
trans-1,2-Dichloroethylene	50.0	U	0.00	54.7	ug/L	2	109	(0%-20%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	53.1	ug/L	1	106	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		52.2	48.2	ug/L		96	(70%-130%)			
**Bromofluorobenzene	50.0		45.2	49.5	ug/L		99	(70%-130%)			
**Toluene-d8	50.0		54.4	49.8	ug/L		100	(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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2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 392416

Page 11 of 11

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.

Surrogate Recovery Report

SDG Number: GEL392416

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203504774	LCS for batch 1550896	93	100	101
1203504773	MB for batch 1550896	102	105	92
392416001	B343W4	107	109	94
1203504775	B34DH8PS	100	99	98
1203504776	B34DH8PSD	96	100	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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL392416
Work Order #: 392416

Product: Determination of Metals by ICP-MS
Analytical Method: 6020_METALS_ICPMS
Analytical Procedure: GL-MA-E-014 REV# 27
Analytical Batch: 1549656

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 13
Preparation Batch: 1549655

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
392416001	B343W4
1203501587	Method Blank (MB)ICP-MS
1203501588	Laboratory Control Sample (LCS)
1203501591	392416001(B343W4L) Serial Dilution (SD)
1203501589	392416001(B343W4S) Matrix Spike (MS)
1203501590	392416001(B343W4SD) Matrix Spike Duplicate (MSD)

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

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL392416 GEL Work Order: 392416

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Nik-Cole Elmore

Date: 29 MAR 2016

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL392416

CONTRACT: CPRC0116012

METHOD TYPE: SW846

SAMPLE ID:392416001

BASIS: As Received

DATE COLLECTED 02-MAR-16

CLIENT ID: B343W4

LEVEL: Low

DATE RECEIVED 03-MAR-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	15	ug/L	U	15	50	50	1	MS	BAJ	03/17/16 17:55	160317-4	1549656
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	03/17/16 21:45	160317-6	1549656
7440-38-2	Arsenic	6.08	ug/L		1.7	5	5	1	MS	BAJ	03/17/16 14:12	160317-2	1549656
7440-39-3	Barium	63	ug/L		0.6	2	2	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-47-3	Chromium	2	ug/L	U	2	10	10	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-48-4	Cobalt	0.10	ug/L	U	0.1	1	1	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-50-8	Copper	16.1	ug/L		0.35	1	1	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7439-96-5	Manganese	4.04	ug/L	B	1	5	5	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7439-98-7	Molybdenum	1.81	ug/L		0.165	0.5	0.5	1	MS	BAJ	03/18/16 13:45	160318-7	1549656
7440-02-0	Nickel	0.848	ug/L	B	0.5	2	2	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7782-49-2	Selenium	1.52	ug/L	B	1.5	5	5	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-24-6	Strontium	188	ug/L		2	10	10	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	BAJ	03/17/16 14:12	160317-2	1549656
7440-29-1	Thorium	0.713	ug/L	B	0.383	2	2	1	MS	BAJ	03/17/16 14:12	160317-2	1549656
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	03/16/16 18:34	160316-1	1549656
7440-61-1	Uranium	1.32	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/17/16 14:12	160317-2	1549656
7440-66-6	Zinc	3.5	ug/L	U	3.5	10	10	1	MS	BAJ	03/16/16 18:34	160316-1	1549656

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1549656	1549655	SW846 3005A	50	mL	50	mL	03/03/16	JP1

***Analytical Methods:**

MS SW846 3005A/6020A

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 29, 2016

Page 1 of 6

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 392416

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
QC1203501588	LCS										
Aluminum	2000			2060	ug/L		103	(80%-120%)	BAJ	03/17/16	17:53
Antimony	50.0			51.8	ug/L		104	(80%-120%)		03/17/16	21:44
Arsenic	50.0			54.4	ug/L		109	(80%-120%)		03/17/16	14:10
Barium	50.0			50.2	ug/L		100	(80%-120%)		03/16/16	18:32
Beryllium	50.0			53.4	ug/L		107	(80%-120%)			
Cadmium	50.0			50.2	ug/L		100	(80%-120%)			
Chromium	50.0			48.7	ug/L		97.3	(80%-120%)			
Cobalt	50.0			47.9	ug/L		95.8	(80%-120%)			
Copper	50.0			52.2	ug/L		104	(80%-120%)			
Lead	50.0			50.8	ug/L		102	(80%-120%)			
Manganese	50.0			48.0	ug/L		96.1	(80%-120%)			
Molybdenum	50.0			53.2	ug/L		106	(80%-120%)		03/18/16	13:44
Nickel	50.0			49.2	ug/L		98.4	(80%-120%)		03/16/16	18:32
Selenium	50.0			51.6	ug/L		103	(80%-120%)			
Silver	50.0			51.2	ug/L		102	(80%-120%)			
Strontium	50.0			51.3	ug/L		103	(80%-120%)			
Thallium	50.0			54.2	ug/L		108	(80%-120%)		03/17/16	14:10
Thorium	50.0			51.4	ug/L		103	(80%-120%)			
Tin	50.0			50.7	ug/L		101	(80%-120%)		03/16/16	18:32
Uranium	50.0			51.5	ug/L		103	(80%-120%)		03/17/16	14:10

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QC Summary

Workorder: 392416

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
Zinc	50.0			53.4	ug/L		107	(80%-120%)	BAJ	03/16/16	18:32
QC1203501587	MB										
Aluminum			U	15.0	ug/L					03/17/16	17:51
Antimony			U	1.00	ug/L					03/17/16	21:42
Arsenic			U	1.70	ug/L					03/17/16	14:08
Barium			U	0.600	ug/L					03/16/16	18:29
Beryllium			U	0.200	ug/L						
Cadmium			U	0.110	ug/L						
Chromium			U	2.00	ug/L						
Cobalt			U	0.100	ug/L						
Copper			U	0.350	ug/L						
Lead			U	0.500	ug/L						
Manganese			U	1.00	ug/L						
Molybdenum			U	0.165	ug/L					03/18/16	13:43
Nickel			U	0.500	ug/L					03/16/16	18:29
Selenium			U	1.50	ug/L						
Silver			U	0.200	ug/L						
Strontium			U	2.00	ug/L						
Thallium			U	0.450	ug/L					03/17/16	14:08
Thorium			U	0.383	ug/L						
Tin			U	1.00	ug/L					03/16/16	18:29
Uranium			U	0.067	ug/L					03/17/16	14:08

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QC Summary

Workorder: 392416

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
Zinc			U	3.50	ug/L				BAJ	03/16/16	18:29
QC1203501589	392416001	MS									
Aluminum	2000	U	15.0	2010	ug/L		100	(75%-125%)		03/17/16	17:56
Antimony	50.0	U	1.00	51.3	ug/L		103	(75%-125%)		03/17/16	21:46
Arsenic	50.0		6.08	57.7	ug/L		103	(75%-125%)		03/17/16	14:14
Barium	50.0		63.0	114	ug/L		103	(75%-125%)		03/16/16	18:37
Beryllium	50.0	U	0.200	53.0	ug/L		106	(75%-125%)			
Cadmium	50.0	U	0.110	49.6	ug/L		99.2	(75%-125%)			
Chromium	50.0	U	2.00	50.1	ug/L		96.7	(75%-125%)			
Cobalt	50.0	U	0.100	47.0	ug/L		94	(75%-125%)			
Copper	50.0		16.1	62.7	ug/L		93.1	(75%-125%)			
Lead	50.0	U	0.500	49.3	ug/L		98.6	(75%-125%)			
Manganese	50.0	B	4.04	51.2	ug/L		94.4	(75%-125%)			
Molybdenum	50.0		1.81	56.0	ug/L		108	(75%-125%)		03/18/16	13:47
Nickel	50.0	B	0.848	48.3	ug/L		94.8	(75%-125%)		03/16/16	18:37
Selenium	50.0	B	1.52	50.6	ug/L		98.2	(75%-125%)			
Silver	50.0	U	0.200	50.3	ug/L		101	(75%-125%)			
Strontium	50.0		188	239	ug/L		103	(75%-125%)			
Thallium	50.0	U	0.450	51.4	ug/L		102	(75%-125%)		03/17/16	14:14
Thorium	50.0	B	0.713	51.8	ug/L		102	(75%-125%)			
Tin	50.0	U	1.00	51.0	ug/L		102	(75%-125%)		03/16/16	18:37
Uranium	50.0		1.32	51.9	ug/L		101	(75%-125%)		03/17/16	14:14

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QC Summary

Workorder: 392416

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
Zinc	50.0	U	3.50	48.7	ug/L		96.2	(75%-125%)	BAJ	03/16/16	18:37
QC1203501590 392416001 MSD											
Aluminum	2000	U	15.0	2010	ug/L	0.0612	100	(0%-20%)		03/17/16	17:58
Antimony	50.0	U	1.00	51.5	ug/L	0.325	103	(0%-20%)		03/17/16	21:48
Arsenic	50.0		6.08	57.1	ug/L	1.03	102	(0%-20%)		03/17/16	14:16
Barium	50.0		63.0	115	ug/L	1.03	105	(0%-20%)		03/16/16	18:39
Beryllium	50.0	U	0.200	52.6	ug/L	0.751	105	(0%-20%)			
Cadmium	50.0	U	0.110	51.0	ug/L	2.81	102	(0%-20%)			
Chromium	50.0	U	2.00	50.4	ug/L	0.569	97.3	(0%-20%)			
Cobalt	50.0	U	0.100	47.2	ug/L	0.439	94.4	(0%-20%)			
Copper	50.0		16.1	61.0	ug/L	2.73	89.7	(0%-20%)			
Lead	50.0	U	0.500	49.1	ug/L	0.506	98.1	(0%-20%)			
Manganese	50.0	B	4.04	51.2	ug/L	0.0605	94.3	(0%-20%)			
Molybdenum	50.0		1.81	57.4	ug/L	2.48	111	(0%-20%)		03/18/16	13:48
Nickel	50.0	B	0.848	48.0	ug/L	0.515	94.3	(0%-20%)		03/16/16	18:39
Selenium	50.0	B	1.52	52.6	ug/L	3.83	102	(0%-20%)			
Silver	50.0	U	0.200	51.6	ug/L	2.53	103	(0%-20%)			
Strontium	50.0		188	250	ug/L	4.17	124	(0%-20%)			
Thallium	50.0	U	0.450	52.0	ug/L	1.16	103	(0%-20%)		03/17/16	14:16
Thorium	50.0	B	0.713	52.8	ug/L	1.88	104	(0%-20%)			
Tin	50.0	U	1.00	51.7	ug/L	1.39	103	(0%-20%)		03/16/16	18:39
Uranium	50.0		1.32	53.2	ug/L	2.44	104	(0%-20%)		03/17/16	14:16

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QC Summary

Workorder: 392416

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
Zinc	50.0	U	3.50		50.1	ug/L	2.93	99.1	(0%-20%)	BAJ	03/16/16 18:39
QC1203501591	392416001	SDILT									
Aluminum		U	7.81	DU	75.0	ug/L	N/A		(0%-10%)		03/17/16 18:00
Antimony		U	0.047	DU	5.00	ug/L	N/A		(0%-10%)		03/17/16 21:49
Arsenic			6.08	D	2.15	ug/L	76.7		(0%-10%)		03/17/16 14:18
Barium			63.0	D	12.9	ug/L	2.33		(0%-10%)		03/16/16 18:44
Beryllium		U	0.008	DU	1.00	ug/L	N/A		(0%-10%)		
Cadmium		U	0.005	DU	0.550	ug/L	N/A		(0%-10%)		
Chromium		U	1.77	DU	10.0	ug/L	N/A		(0%-10%)		
Cobalt		U	0.028	DU	0.500	ug/L	N/A		(0%-10%)		
Copper			16.1	D	3.38	ug/L	4.74		(0%-10%)		
Lead		U	0.042	DU	2.50	ug/L	N/A		(0%-10%)		
Manganese		B	4.04	DU	5.00	ug/L	N/A		(0%-10%)		
Molybdenum			1.81	D	0.397	ug/L	9.85		(0%-10%)		03/18/16 13:49
Nickel		B	0.848	DU	2.50	ug/L	N/A		(0%-10%)		03/16/16 18:44
Selenium		B	1.52	DU	7.50	ug/L	N/A		(0%-10%)		
Silver		U	0.012	DU	1.00	ug/L	N/A		(0%-10%)		
Strontium			188	D	35.5	ug/L	5.44		(0%-10%)		
Thallium		U	0.304	DU	2.25	ug/L	N/A		(0%-10%)		03/17/16 14:18
Thorium		B	0.713	D	0.413	ug/L	190		(0%-10%)		
Tin		U	0.188	DU	5.00	ug/L	N/A		(0%-10%)		03/16/16 18:44
Uranium			1.32	D	0.272	ug/L	3.34		(0%-10%)		03/17/16 14:18

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QC Summary

Workorder: 392416

Page 6 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1549656										
Zinc	U	0.582	DU	17.5	ug/L	N/A		(0%-10%)	BAJ	03/16/16	18:44

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL392416
Work Order #: 392416**

Product: TRITIUM_DIST_LSC: COMMON
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 21
Analytical Batch: 1550012

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
392416001	B343W4
1203502580	Method Blank (MB)
1203502581	391908001(NonSDG) Sample Duplicate (DUP)
1203502582	391908001(NonSDG) Matrix Spike (MS)
1203502583	Laboratory Control Sample (LCS)

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

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: TC99_EIE_LSC: COMMON
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 4
Analytical Batch: 1550271

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
392416001	B343W4
1203503270	Method Blank (MB)
1203503271	391991009(NonSDG) Sample Duplicate (DUP)
1203503272	Laboratory Control Sample (LCS)

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

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL392416 GEL Work Order: 392416

The Qualifiers in this report are defined as follows:

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

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Theresa Austin

Date: 23 MAR 2016

Title: Group Leader

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL392416	Client: CPRC001	Project: CPRC0116012
Lab Sample ID: 392416001	Date Collected: 03/02/2016 10:54	Matrix: WATER
	Date Received: 03/03/2016 09:05	
Client ID: B343W4	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1550012	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 03/13/2016 02:42	Aliquot: 50 mL	Instrument: LSCORANGE
Data File: T1550012.xls	Prep Method: EPA 906.0 Modified	Count Time: 120.0295 min
Prep Batch: 1550012		
Prep Date: 03/11/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-7.22	pCi/L	+/-47.4	47.4	84.9	100

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

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL392416	Client: CPRC001	Project: CPRC0116012
Lab Sample ID: 392416001	Date Collected: 03/02/2016 10:54	Matrix: WATER
	Date Received: 03/03/2016 09:05	
Client ID: B343W4	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1550271	Analyst: MYM1	SOP Ref: GL-RAD-A-059
Run Date: 03/20/2016 13:05	Aliquot: 200 mL	Instrument: LSCGREEN
Data File: E1550271.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 50 min
Prep Batch: 1550271		
Prep Date: 03/15/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	6.29	pCi/L	+/-6.84	6.87	11.5	15.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24400	25700	CPM	95.3	(30%-105%)

Comments:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
 TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Quality Control Summary

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QC Summary

Report Date: March 23, 2016
Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 392416

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1550012								
QC1203502580	MB								
Tritium			U	2.68	pCi/L			TXJ1	03/13/1611:40
				Uncert: +/-46.5					
				TPU: +/-46.5					
QC1203502581	391908001 DUP								
Tritium		U	33.3	U	4.95				03/13/1613:43
				Uncert: +/-50.0		RPD: 0	N/A		
				TPU: +/-50.4		RER: 0.798	(0-2)		
QC1203502582	391908001 MS								
Tritium	2370	U	33.3		1910	REC: 81	(75%-125%)		03/13/1615:45
				Uncert: +/-50.0					
				TPU: +/-50.4					
QC1203502583	LCS								
Tritium	2370				2060	REC: 87	(80%-120%)		03/13/1616:03
				Uncert: +/-327					
				TPU: +/-515					
Batch	1550271								
QC1203503270	MB								
Technetium-99			U	7.77	pCi/L			MYM1	03/20/1618:36
				Uncert: +/-6.78					
				TPU: +/-6.83					
**Technetium-99m Tracer	25700				25000	REC: 98	(30%-105%)		
QC1203503271	391991009 DUP								
Technetium-99		U	8.66	U	5.80				03/20/1619:28
				Uncert: +/-7.22		RPD: 0	N/A		
				TPU: +/-7.28		RER: 0.567	(0-2)		
**Technetium-99m Tracer	25700		24100		25100	REC: 98	(30%-105%)		
QC1203503272	LCS								
Technetium-99	430				419	REC: 97	(80%-120%)		03/20/1620:20
				Uncert: +/-14.0					
				TPU: +/-48.6					
**Technetium-99m Tracer	25700				25300	REC: 99	(30%-105%)		

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- A The TIC is a suspected aldol-condensation product
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample

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QC Summary

Workorder: 392416

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
C						Analyte has been confirmed by GC/MS analysis				
C						Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.				
D						Results are reported from a diluted aliquot of sample.				
E						Concentration exceeds the calibration range of the instrument				
E						Reported value is estimated due to interferences. See comment in narrative.				
J						The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated				
M						Duplicate precision not met.				
N						Spike Sample recovery is outside control limits.				
P						Aroclor target analyte with greater than 25% difference between column analyses.				
S						Reported value determined by the Method of Standard Additions (MSA)				
T						Spike and/or spike duplicate sample recovery is outside control limits.				
U						Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.				
UX						Gamma Spectroscopy--Uncertain identification				
W						Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.				
X						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
Y						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
Z						Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier				
o						Analyte failed to recover within LCS limits (Organics only)				

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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