



June 27, 2017

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

Re: CHPRC SAF I17-006
Work Order: 424518
SDG: GEL424518

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 02, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: I17-006-076, I17-006-091, I17-006-092, I17-006-093 and I17-006-096
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....8

Data Review Qualifier Definitions.....15

Laboratory Certifications.....17

Volatile Analysis.....19

 Case Narrative.....20

 Sample Data Summary.....24

 Quality Control Summary.....27

Metals Analysis.....39

 Case Narrative.....40

 Sample Data Summary.....43

 Quality Control Summary.....47

General Chem Analysis.....50

 Case Narrative.....51

 Sample Data Summary.....55

 Quality Control Summary.....57

Radiological Analysis.....61

 Case Narrative.....62

 Sample Data Summary.....68

 Quality Control Summary.....81

Case Narrative

June 27, 2017

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF I17-006
SDG: GEL424518

June 27, 2017

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on June 02, 2017, 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 All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative.

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
424518001	B39FN3
424518002	B39FC0
424518003	B39FM9
424518004	B39FN1
424518005	B39FR1

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.

June 27, 2017

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, General Chemistry, 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.


Brielle Luthman for
Heather Shaffer
Project Manager

June 27, 2017

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL424518
Work Order #: 424518

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
1203806007 (B39FH3PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (B39FH3PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

Technical Information

Sample Re-extraction/Re-analysis

Samples 424518002 (B39FC0) and 424518003 (B39FM9) were re-analyzed and reported due to possible carry-over from a previously analyzed sample.

Metals

Determination of Metals by ICP-MS

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.

Calibration Information

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing the sample in this SDG did not meet the acceptance criteria for uranium. The samples bracketed by this CCB, however, contained the element which failed at a concentration at least ten times greater than the concentration in the CCB. This indicates that any contribution to the concentration of these elements in the samples from potential laboratory contamination would be minimal.

General Chemistry

Ion Chromatography

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.

Technical Information

Sample Dilutions

The following samples 1203802718 (B39FN3DUP), 1203802719 (B39FN3PS) and 424518001 (B39FN3) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	424518
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

Sample Re-analysis

Samples 1203802716 (MB), 1203802717 (LCS), 1203802718 (B39FN3DUP), 1203802719 (B39FN3PS) and 424518001 (B39FN3) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported.

Radiochemistry

SRISO_SEP_PRECIP_GPC: COMMON

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

QC Information

The sample and duplicate, 1203803799 (B39FR1DUP) and 424518005 (B39FR1), did not meet the client relative error ratio requirement; however, both results are less than their respective MDCs.

Technical Information

Recounts

Samples 1203803799 (B39FR1DUP) and 424518003 (B39FM9) were recounted due to a suspected false positive. The recounts are reported. Sample 424518004 (B39FN1) was verified by recounting at least five days

June 27, 2017

from the separation date. The recount is reported.

9310_ALPHABETA_GPC: COMMON

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

QC Information

Matrix Spike and Matrix Spike Duplicate, 1203803803 (Non SDG 424658003MS) and 1203803804 (Non SDG 424658003MSD), do not meet the beta recovery requirement due to the sample activity being greater than five times the spiked nominal concentration.

Technical Information

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts

Sample 1203803801 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203803803 (Non SDG 424658003MS) and 1203803804 (Non SDG 424658003MSD), aliquots were reduced to conserve sample volume.

C14_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.

TRITIUM_DIST_LSC: COMMON

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.

Technical Information

June 27, 2017

Recounts

Sample 1203811842 (LCS) was recounted due to low recovery. The recount is reported.

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

June 27, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # I17-006-093	
424518		Page 1 of 1	
Collector Jeff Tuckesen CHPRC	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	
SAF No. I17-006	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071	
Project Title 100KR4, May 2017	Logbook No. HNF-N-506 88 / 65	Ice Chest No. 6205-615	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 779281849336	
Protocol CERCLA	Priority: 30 Days	Offsite Property No. 7975	
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 438.1		SPECIAL INSTRUCTIONS N/A	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No. B39FN3	Filter N	* Date WJUN 0 1 2017 0918	Time 1x125-mL G/P
No/Type Container	Sample Analysis	Holding Time	Preservative
	9056_ANIONS_IC: COMMON	48 Hours	Cool <=6C

Relinquished By Jeff Tuckesen CHPRC	Print 	Sign	Date/Time JUN 0 1 2017 1155
Received By Janelle Zunker CHPRC	Print 	Sign	Date/Time JUN 0 1 2017 1155
Relinquished By Janelle Zunker CHPRC	Print 	Sign	Date/Time JUN 0 1 2017 1400
Received By STACY BOONIS	Print 	Sign	Date/Time 6-2-17 9:10
Relinquished By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time
Received By	Print	Sign	Date/Time

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

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

PRINTED ON 3/27/2017

FSR ID = FSR38347

A-6004-842 (REV 2)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

I17-006-076

Page 1 of 1

Collector: Roy Shepard / CHPRC
 Telephone No.: 509-376-4650
 Contact/Requester: Karen Waters-Husted
 Purchase Order/Charge Code: 300071
 SAF No.: I17-006
 Sampling Origin: Hanford Site
 Project Title: 100KR4, May 2017
 Logbook No.: HNF-N-506 88 / 64
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Protocol: CERCLA
 Priority: 30 Days
 Ice Chest No.: CWS-6116
 Bill of Lading/Air Bill No.: 7792 7754 5456
 Offsite Property No.: 7969

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

N/A

Hold Time

Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39FC0	N	W	5-31-17	1205	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B39FC0	N	W	/	/	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39FC0	N	W	/	/	1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B39FC0	N	W	/	/	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B39FC0	N	W	5-31-17	1205	1x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2

June 27, 2017

Relinquished By Roy Shepard CHPRC	Print <i>[Signature]</i>	Sign	Date/Time MAY 31 2017 1330	Received By SSU-1	Print	Sign	Date/Time MAY 31 2017 1330	Matrix *
Relinquished By Janelle Zunker CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JUN 01 2017 0730	Received By Janelle Zunker CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JUN 01 2017 0730	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By Janelle Zunker CHPRC	Print <i>[Signature]</i>	Sign	Date/Time JUN 01 2017 1400	Received By FED EX	Print FED EX	Sign	Date/Time JUN 01 2017 1400	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Date/Time
	FED EX							6-2-17 9:10
	Disposed By: Stacy Boone							

June 27, 2017

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

I17-006-091

Page 1 of 1

424518

Collector: Jeff Tucksen CHPRC
 SAF No.: I17-006
 Project Title: 100KR4, May 2017
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: CERCLA
 Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No.: HNF-N-506 88/LS
 Method of Shipment: Commercial Carrier
 Priority: 30 Days
 Telephone No.: 509-376-4650
 Purchase Order/Charge Code: 300071
 Ice Chest No.: GWS-645
 Bill of Lading/Air Bill No.: 709281849336
 Offsite Property No.: 7975

Special Instructions: N/A
 Hold Time: []
 Total Activity Exemption: Yes No

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39FM9	N	JUN 01 2017	0954	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B39FM9	N			5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39FM9	N			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B39FM9	N			1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B39FM9	N			1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

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
 A Dist. & in generated during purge
 need heads: price on: VOA

Relinquished By Jeff Tucksen CHPRC	Print 	Sign	Date/Time JUN 01 2017 1155	Received By Janelle Zunker CHPRC	Print 	Sign	Date/Time JUN 01 2017 1155	Matrix *
Relinquished By Janelle Zunker CHPRC	Print 	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By FEDEX	Print FEDEX	Sign	Date/Time JUN 01 2017 1400	Received By STACY BOONE	Print STACY BOONE	Sign	Date/Time 6/2/17 9:10	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By FEDEX	Print FEDEX	Sign	Date/Time JUN 01 2017 1400	Received By	Print	Sign	Date/Time	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 PRINTED ON 3/27/2017
 FSR ID = FSR33142
 A-6004-842 (REV 2)

June 27, 2017

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **117-006-096**
Page 1 of 1

424518

Collector: Jeff Tucksen
CHPRC

SAF No. 117-006

Project Title 100KR4, May 2017

Shipped To (Lab) GEL Laboratories, LLC

Protocol CERCLA

Contact/Requester Karen Waters-Husted

Sampling Origin Hanford Site

Logbook No. HNF-N-506 88165+66

Method of Shipment Commercial Carrier

Priority: 30 Days **PRIORITY**

Telephone No. 509-376-4650

Purchase Order/Charge Code 300071

Ice Chest No. 6 WS-615

Bill of Lading/Air Bill No. 779281849336

Offsite Property No. 7975

Hold Time

SPECIAL INSTRUCTIONS N/A

Total Activity Exemption: Yes No

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39FR1	N	W	JUN 01 2017	1112	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B39FR1	N	W			1x500-mL G/P	C14_LSC: COMMON	6 Months	None
B39FR1	N	W			1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B39FR1	N	W			1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By Jeff Tucksen CHPRC	Print 	Sign	Date/Time JUN 01 2017 1155	Received By Janette Zunker CHPRC	Print 	Sign	Date/Time JUN 01 2017 1155	Matrix *
Relinquished By Janette Zunker CHPRC	Print 	Sign	Date/Time JUN 01 2017 1400	Received By Janette Zunker CHPRC	Print 	Sign	Date/Time JUN 01 2017 1400	Matrix *
Relinquished By FED EX	Print 	Sign	Date/Time JUN 01 2017 1400	Received By STACY BOONE	Print 	Sign	Date/Time 6/2/17 9:10	Matrix *

15 of 88

FINAL SAMPLE DISPOSITION

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

Disposed By

Date/Time

PRINTED ON 3/27/2017

FSR ID = FSR43337

A-6004-842 (REV 2)

June 27, 2017

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC		SDG/AR/COC/Work Order: 424518		
Received By: Stacy Boone		Date Received: 2-JUN-17		
Carrier and Tracking Number		Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 7792 8185 0281-1c 7792 7756 5456-1c 7792 8184 9336-2c 7792 8185 0176-20c 7792 8185 0204-21c		
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____		
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 61217 CPM / mR/Hr Classified as: Rad 1 <input checked="" type="checkbox"/> Rad 2 <input type="checkbox"/> Rad 3 <input type="checkbox"/> 637202 <input checked="" type="checkbox"/> 61217 *See below		
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____		
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: 1R3-17 Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>			If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
Comments (Use Continuation Form if needed): *Radioactive Sample on unique SRP.				

PM (or PMA) review: Initials **BL** Date **6.5.17** Page **1** of **1**

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

June 27, 2017

Laboratory Certifications

List of current GEL Certifications as of 27 June 2017

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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
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	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

June 27, 2017

GC/MS Volatile

Technical Case Narrative

CH2M Hill Plateau Remediation Company (CPRC)

SDG #: GEL424518

Work Order #: 424518

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

Analytical Method: SW846 8260C

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

Analytical Batch: 1671888

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518002	B39FC0
424518003	B39FM9
1203806005	Method Blank (MB)
1203806006	Laboratory Control Sample (LCS)
1203806007	424245003(B39FH3) Post Spike (PS)
1203806008	424245003(B39FH3) Post Spike Duplicate (PSD)
1203806060	Method Blank (MB)
1203806061	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Sample	Analyte	Value
1203806007 (B39FH3PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (B39FH3PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

Technical Information

Sample Re-extraction/Re-analysis

Samples 424518002 (B39FC0) and 424518003 (B39FM9) were re-analyzed and reported due to possible carry-over from a previously analyzed sample.

Certification Statement

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

June 27, 2017

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

June 27, 2017

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: GEL424518 GEL Work Order: 424518

The Qualifiers in this report are defined as follows:

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated

T Spike and/or spike duplicate sample recovery is outside control limits.

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

DL Indicates that sample is diluted.

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

RE Indicates that sample is re-extracted.

Review/Validation

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

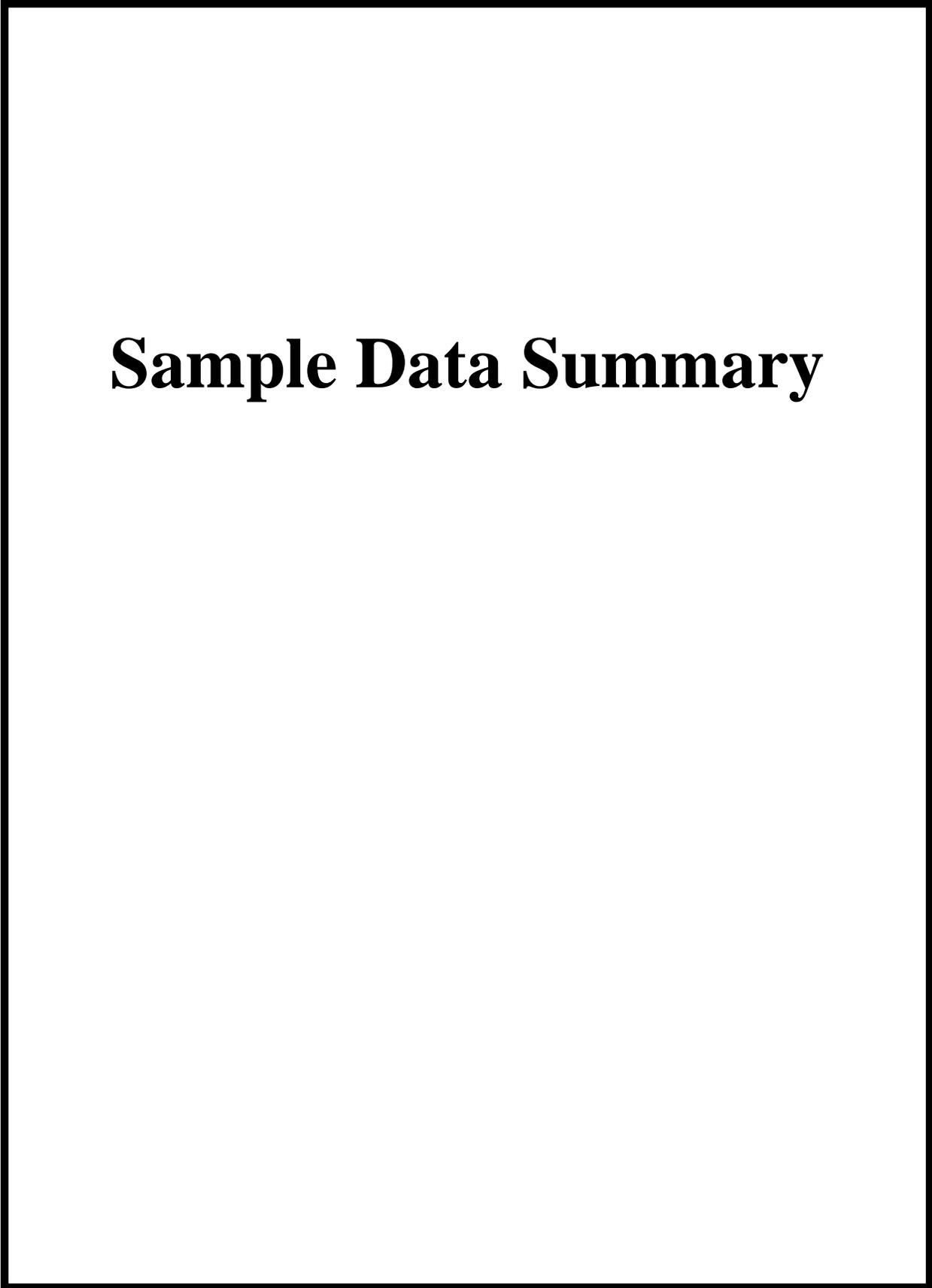
The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 23 JUN 2017

Title: Data Validator



Sample Data Summary

June 27, 2017

Page 1 of 1

Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL424518	Date Collected: 05/31/2017 12:05	Matrix: WATER
Lab Sample ID: 424518002	Date Received: 06/02/2017 09:10	
Client ID: B39FC0	Client: CPRC001	Project: CPRC0117006
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/08/2017 15:54	Inst: VOA3.I	Dilution: 1
Prep Date: 06/08/2017 15:54	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060817V3\3G415.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	J	1.66	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	J	4.03	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

June 27, 2017

Page 1 of 1

Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL424518	Date Collected: 06/01/2017 09:54	Matrix: WATER
Lab Sample ID: 424518003	Date Received: 06/02/2017 09:10	
Client ID: B39FM9	Client: CPRC001	Project: CPRC0117006
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/08/2017 16:24	Inst: VOA3.I	Dilution: 1
Prep Date: 06/08/2017 16:24	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060817V3\3G416.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	J	0.610	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	J	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 23, 2017

Page 1 of 10

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424518

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
QC1203806006	LCS										
1,1,1-Trichloroethane	50.0			48.3	ug/L		97	(70%-130%)	VXY1	06/07/17	10:56
1,1,2-Trichloroethane	50.0			48.6	ug/L		97	(70%-130%)			
1,1-Dichloroethane	50.0			51.1	ug/L		102	(70%-130%)			
1,1-Dichloroethylene	50.0			46.5	ug/L		93	(70%-130%)			
1,2-Dichloroethane	50.0			46.9	ug/L		94	(70%-130%)			
2-Butanone	250			264	ug/L		106	(70%-130%)			
4-Methyl-2-pentanone	250			233	ug/L		93	(70%-130%)			
Acetone	250			273	ug/L		109	(70%-130%)			
Benzene	50.0			46.1	ug/L		92	(70%-130%)			
Carbon disulfide	250			231	ug/L		92	(70%-130%)			
Carbon tetrachloride	50.0			48.2	ug/L		96	(70%-130%)			
Chlorobenzene	50.0			47.4	ug/L		95	(70%-130%)			
Chloroform	50.0			46.2	ug/L		92	(70%-130%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 2 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Ethylbenzene	50.0			45.1	ug/L		90	(70%-130%)	VXY1	06/07/17	10:56
Methylene chloride	50.0			44.4	ug/L		89	(70%-130%)			
Tetrachloroethylene	50.0			46.0	ug/L		92	(70%-130%)			
Toluene	50.0			48.1	ug/L		96	(70%-130%)			
Trichloroethylene	50.0			49.1	ug/L		98	(70%-130%)			
Vinyl chloride	50.0			45.7	ug/L		91	(70%-130%)			
Xylenes (total)	150			141	ug/L		94	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			44.1	ug/L		88	(70%-130%)			
**Bromofluorobenzene	50.0			53.7	ug/L		107	(70%-130%)			
**Toluene-d8	50.0			46.9	ug/L		94	(70%-130%)			
QC1203806061	LCS										
1,1,1-Trichloroethane	50.0			48.7	ug/L		97	(70%-130%)		06/08/17	09:48
1,1,2-Trichloroethane	50.0			47.4	ug/L		95	(70%-130%)			
1,1-Dichloroethane	50.0			49.7	ug/L		99	(70%-130%)			
1,1-Dichloroethylene	50.0			48.6	ug/L		97	(70%-130%)			
1,2-Dichloroethane	50.0			46.2	ug/L		92	(70%-130%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 3 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
2-Butanone	250			246	ug/L		98	(70%-130%)	VXY1	06/08/17	09:48
4-Methyl-2-pentanone	250			217	ug/L		87	(70%-130%)			
Acetone	250			240	ug/L		96	(70%-130%)			
Benzene	50.0			46.7	ug/L		93	(70%-130%)			
Carbon disulfide	250			239	ug/L		95	(70%-130%)			
Carbon tetrachloride	50.0			48.4	ug/L		97	(70%-130%)			
Chlorobenzene	50.0			47.6	ug/L		95	(70%-130%)			
Chloroform	50.0			46.5	ug/L		93	(70%-130%)			
Ethylbenzene	50.0			46.7	ug/L		93	(70%-130%)			
Methylene chloride	50.0			43.5	ug/L		87	(70%-130%)			
Tetrachloroethylene	50.0			46.4	ug/L		93	(70%-130%)			
Toluene	50.0			48.9	ug/L		98	(70%-130%)			
Trichloroethylene	50.0			49.0	ug/L		98	(70%-130%)			
Vinyl chloride	50.0			42.8	ug/L		86	(70%-130%)			
Xylenes (total)	150			135	ug/L		90	(70%-130%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 4 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
**1,2-Dichloroethane-d4	50.0			41.2	ug/L		82	(70%-130%)	VXY1	06/08/17	09:48
**Bromofluorobenzene	50.0			53.8	ug/L		108	(70%-130%)			
**Toluene-d8	50.0			45.1	ug/L		90	(70%-130%)			
QC1203806005	MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/07/17	12:28
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 5 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Chloroform			U	0.300	ug/L				VXY1	06/07/17	12:28
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0			46.7	ug/L		93	(70%-130%)			
**Bromofluorobenzene	50.0			49.7	ug/L		99	(70%-130%)			
**Toluene-d8	50.0			50.9	ug/L		102	(70%-130%)			
QC1203806060 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/08/17	11:19
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						

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 6 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
1,2-Dichloroethane			U	0.300	ug/L				VXY1	06/08/17	11:19
2-Butanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Ethylbenzene			U	0.300	ug/L						
Methylene chloride			U	1.60	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl chloride			U	0.300	ug/L						

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 7 of 10

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Xylenes (total)			U	0.300	ug/L				VXY1	06/08/17	11:19
**1,2-Dichloroethane-d4	50.0			43.0	ug/L		86	(70%-130%)			
**Bromofluorobenzene	50.0			50.8	ug/L		102	(70%-130%)			
**Toluene-d8	50.0			45.3	ug/L		91	(70%-130%)			
QC1203806007 424245003 PS											
1,1,1-Trichloroethane	50.0	U	0.00	40.5	ug/L		81	(70%-130%)		06/07/17	20:08
1,1,2-Trichloroethane	50.0	U	0.00	49.5	ug/L		99	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	41.6	ug/L		83	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	44.5	ug/L		89	(70%-130%)			
2-Butanone	250	TU	0.00 T	154	ug/L		62 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	224	ug/L		89	(70%-130%)			
Acetone	250	TU	0.00 T	101	ug/L		40 *	(70%-130%)			
Benzene	50.0	U	0.00	44.4	ug/L		89	(70%-130%)			
Carbon disulfide	250	U	0.00	224	ug/L		89	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	41.6	ug/L		83	(70%-130%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 8 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Chlorobenzene	50.0	U	0.00	46.6	ug/L		93	(70%-130%)	VXY1	06/07/17	20:08
Chloroform	50.0	J	0.310	42.6	ug/L		85	(70%-130%)			
Ethylbenzene	50.0	U	0.00	47.1	ug/L		94	(70%-130%)			
Methylene chloride	50.0	U	0.00	43.1	ug/L		86	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	42.9	ug/L		86	(70%-130%)			
Toluene	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
Trichloroethylene	50.0	J	3.88	47.4	ug/L		87	(70%-130%)			
Vinyl chloride	50.0	U	0.00	42.7	ug/L		85	(70%-130%)			
Xylenes (total)	150	U	0.00	136	ug/L		91	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		44.3	38.5	ug/L		77	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	49.3	ug/L		99	(70%-130%)			
**Toluene-d8	50.0		46.7	47.2	ug/L		94	(70%-130%)			
QC1203806008 424245003 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	43.7	ug/L	8	87	(0%-20%)		06/07/17	20:38
1,1,2-Trichloroethane	50.0	U	0.00	48.0	ug/L	3	96	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	46.5	ug/L	1	93	(0%-20%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 9 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
1,1-Dichloroethylene	50.0	U	0.00		42.9	ug/L	3	86	(0%-20%)	VXY1	06/07/17 20:38
1,2-Dichloroethane	50.0	U	0.00		45.0	ug/L	1	90	(0%-20%)		
2-Butanone	250	TU	0.00	T	148	ug/L	4	59*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		214	ug/L	4	86	(0%-20%)		
Acetone	250	TU	0.00	T	108	ug/L	7	43*	(0%-20%)		
Benzene	50.0	U	0.00		44.4	ug/L	0	89	(0%-20%)		
Carbon disulfide	250	U	0.00		218	ug/L	3	87	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		43.1	ug/L	4	86	(0%-20%)		
Chlorobenzene	50.0	U	0.00		44.4	ug/L	5	89	(0%-20%)		
Chloroform	50.0	J	0.310		44.6	ug/L	4	89	(0%-20%)		
Ethylbenzene	50.0	U	0.00		42.1	ug/L	11	84	(0%-20%)		
Methylene chloride	50.0	U	0.00		43.0	ug/L	0	86	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		42.0	ug/L	2	84	(0%-20%)		
Toluene	50.0	U	0.00		44.7	ug/L	4	89	(0%-20%)		
Trichloroethylene	50.0	J	3.88		47.3	ug/L	0	87	(0%-20%)		

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 10 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Vinyl chloride	50.0	U	0.00	43.7	ug/L	2	87	(0%-20%)	VXY1	06/07/17	20:38
Xylenes (total)	150	U	0.00	126	ug/L	7	84	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		44.3	39.9	ug/L		80	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	50.6	ug/L		101	(70%-130%)			
**Toluene-d8	50.0		46.7	45.2	ug/L		90	(70%-130%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

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.

June 27, 2017
 Volatile
 Surrogate Recovery Report

SDG Number: GEL424518

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203806006	LCS for batch 1671888	88	94	107
1203806005	MB for batch 1671888	93	102	99
1203806007	B39FH3PS	77	94	99
1203806008	B39FH3PSD	80	90	101
1203806061	LCS for batch 1671888	82	90	108
1203806060	MB for batch 1671888	86	91	102
424518002	B39FC0	78	90	88
424518003	B39FM9	76	91	90

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(70%-130%)

(70%-130%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

June 27, 2017

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL424518

Work Order #: 424518

Product: Determination of Metals by ICP-MS

Analytical Method: SW846 3005A/6020B

Analytical Procedure: GL-MA-E-014 REV# 29

Analytical Batch: 1670552

Preparation Method: SW846 3005A

Preparation Procedure: GL-MA-E-006 REV# 13

Preparation Batch: 1670551

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518002	B39FC0
424518003	B39FM9
424518005	B39FR1
1203802763	Method Blank (MB)ICP-MS
1203802764	Laboratory Control Sample (LCS)
1203802767	424516007(NonSDGL) Serial Dilution (SD)
1203802765	424516007(NonSDGS) Matrix Spike (MS)
1203802766	424516007(NonSDGSD) Matrix Spike Duplicate (MSD)

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.

Calibration Information

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

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.

June 27, 2017

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: GEL424518 GEL Work Order: 424518

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- D Results are reported from a diluted aliquot of sample.
- N Spike 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.

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.

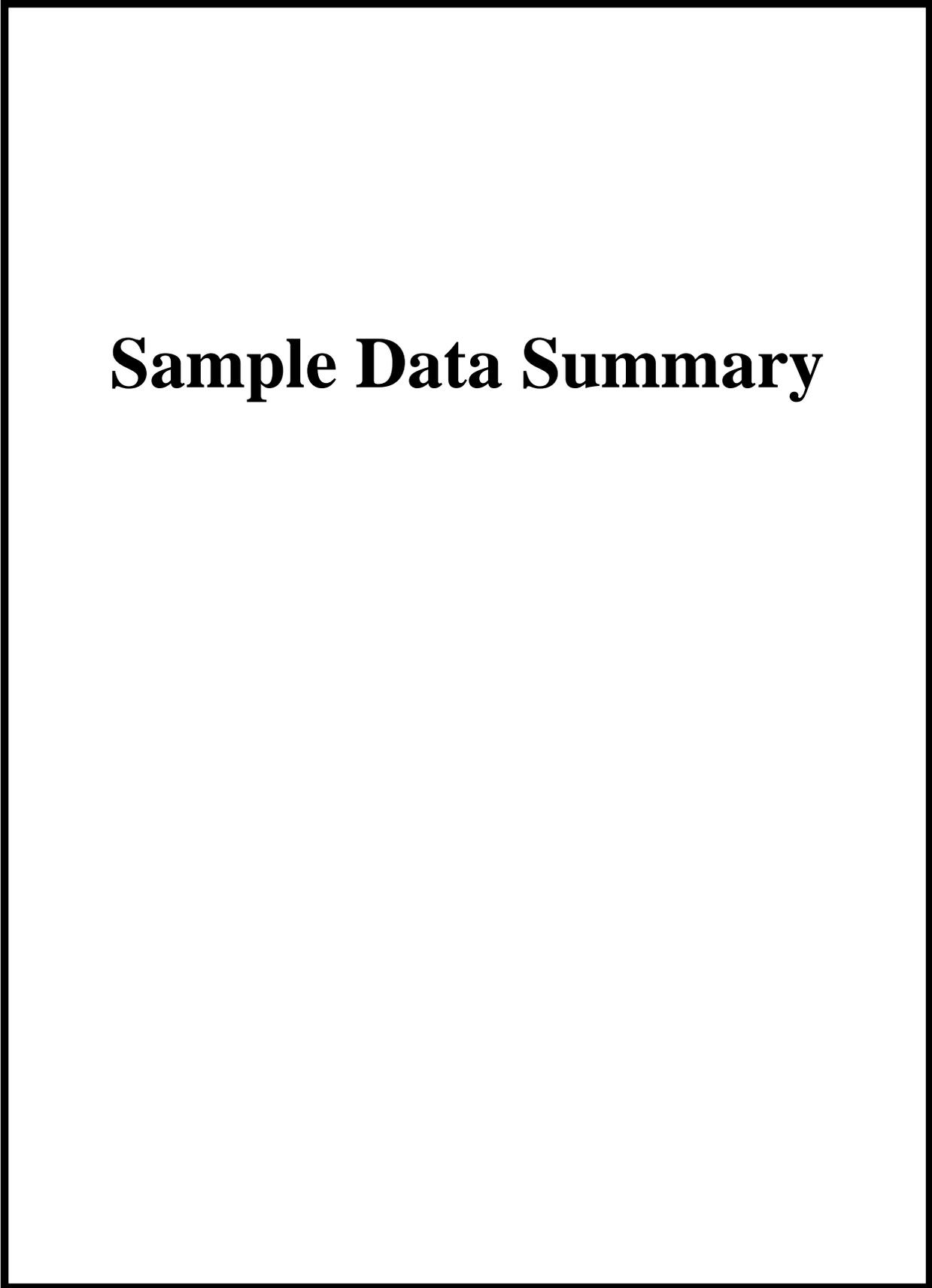
The following data validator verified the information presented in this data report:

Signature: 

Name: Nik-Cole Elmore

Date: 27 JUN 2017

Title: Data Validator



Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424518

CONTRACT: CPRC0117006

METHOD TYPE: SW846

SAMPLE ID:424518002

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: B39FC0

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	32.3	ug/L		3	10	10	1	MS	BAJ	06/22/17 01:12	170621-1	1670552

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670552	1670551	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

***Analytical Methods:**

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424518

CONTRACT: CPRC0117006

METHOD TYPE: SW846

SAMPLE ID:424518003

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: B39FM9

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	31.5	ug/L		3	10	10	1	MS	BAJ	06/22/17 01:15	170621-1	1670552

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670552	1670551	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

***Analytical Methods:**

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424518

CONTRACT: CPRC0117006

METHOD TYPE: SW846

SAMPLE ID:424518005

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: B39FR1

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	68	ug/L		3	10	10	1	MS	BAJ	06/22/17 01:18	170621-1	1670552

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670552	1670551	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

***Analytical Methods:**

MS SW846 3005A/6020B

June 27, 2017

Quality Control Summary

June 27, 2017 GEL LABORATORIES LLC

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

QC Summary

Report Date: June 27, 2017

Page 1 of 2

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424518

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
QC1203802764		LCS									
Chromium	50.0			50.9	ug/L		102	(80%-120%)	BAJ	06/22/17	00:39
QC1203802763		MB									
Chromium			U	3.00	ug/L					06/22/17	00:36
QC1203802765		424516007 MS									
Chromium	50.0		53.3	106	ug/L		106	(75%-125%)		06/22/17	00:46
QC1203802766		424516007 MSD									
Chromium	50.0		53.3	107	ug/L	0.804	108	(0%-20%)		06/22/17	00:49
QC1203802767		424516007 SDILT									
Chromium			53.3 D	10.0	ug/L	5.85		(0%-20%)		06/22/17	00:56

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

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 2 of 2

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

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.

General Chem Analysis

June 27, 2017

Case Narrative

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL424518
Work Order #: 424518

Product: Ion Chromatography

Analytical Method: 9056_ANIONS_IC

Analytical Procedure: GL-GC-E-086 REV# 25

Analytical Batch: 1670535

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518001	B39FN3
1203802716	Method Blank (MB)
1203802717	Laboratory Control Sample (LCS)
1203802718	424518001(B39FN3) Sample Duplicate (DUP)
1203802719	424518001(B39FN3) Post Spike (PS)

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.

Technical Information

Sample Dilutions

The following samples 1203802718 (B39FN3DUP), 1203802719 (B39FN3PS) and 424518001 (B39FN3) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	424518
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

Sample Re-analysis

Samples 1203802716 (MB), 1203802717 (LCS), 1203802718 (B39FN3DUP), 1203802719 (B39FN3PS) and 424518001 (B39FN3) were re-analyzed due to CCB failure. The reanalysis data with passing instrument QC was reported.

Certification Statement

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

June 27, 2017

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

June 27, 2017

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: GEL424518 GEL Work Order: 424518

The Qualifiers in this report are defined as follows:

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).

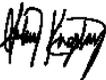
D Results are reported from a diluted aliquot of sample.

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.

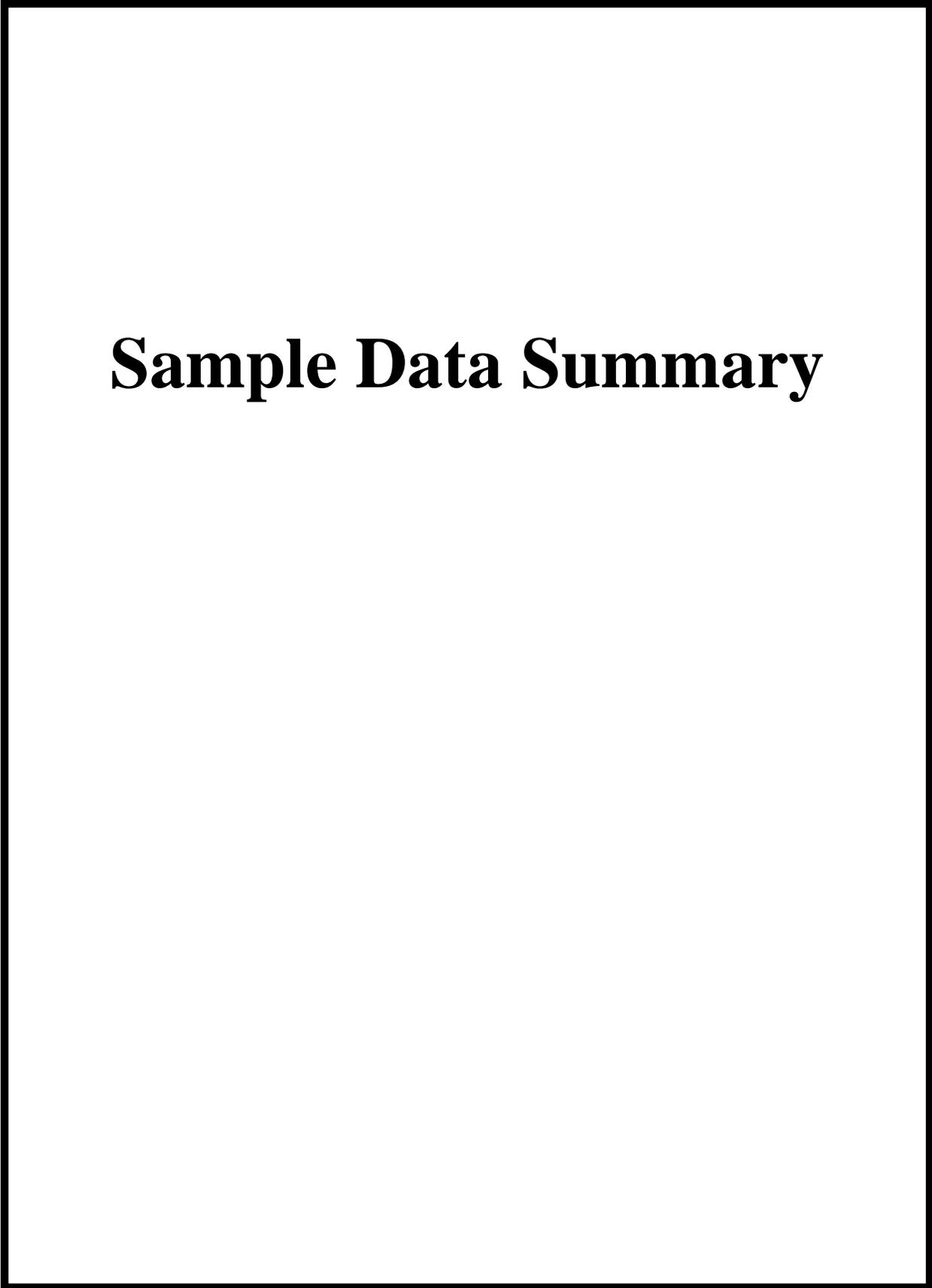
The following data validator verified the information presented in this data report:

Signature: 

Name: **Aubrey Kingsbury**

Date: **22 JUN 2017**

Title: **Analyst I**



Sample Data Summary

Certificate of Analysis

Report Date: June 22, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I17-006

Client Sample ID: B39FN3	Project: CPRC0I17006
Sample ID: 424518001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 09:18	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
9056_ANIONS_IC: COMMON "As Received"												
Fluoride	B	237	33.0	500	ug/L		1	MAR1	06/02/17	1317	1670535	1
Nitrite-N	U	33.0	33.0	250	ug/L		1					
Chloride	D	14400	670	2000	ug/L		10	MAR1	06/02/17	1610	1670535	2
Nitrate-N	D	8430	330	1000	ug/L		10					
Sulfate	D	27400	1330	4000	ug/L		10	MAR1	06/06/17	0228	1670535	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	9056_ANIONS_IC	
3	9056_ANIONS_IC	

Notes:

Column headers are defined as follows:

- | | |
|---------------------------------------|--------------------------------|
| DF: Dilution Factor | Lc/LC: Critical Level |
| DL: Detection Limit | PF: Prep Factor |
| MDA: Minimum Detectable Activity | RL: Reporting Limit |
| MDC: Minimum Detectable Concentration | SQL: Sample Quantitation Limit |

Quality Control Summary

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 22, 2017

Page 1 of 3

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

Contact: Mr. Scot Fitzgerald

Workorder: 424518

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1670535										
QC1203802718	424518001	DUP									
Chloride	D	14400	D	14400	ug/L	0.0625		(0%-20%)	MAR1	06/02/17	17:37
Fluoride	B	237	B	237	ug/L	0.211	^	(+/-500)		06/02/17	13:46
Nitrate-N	D	8430	D	8440	ug/L	0.107		(0%-20%)		06/02/17	17:37
Nitrite-N	U	33.0	U	33.0	ug/L	N/A				06/02/17	13:46
Sulfate	D	27400	D	27300	ug/L	0.478		(0%-20%)		06/06/17	02:57
QC1203802717	LCS										
Chloride	5000			5060	ug/L			101	(80%-120%)	06/02/17	19:03
Fluoride	2500			2630	ug/L			105	(80%-120%)		
Nitrate-N	2500			2560	ug/L			102	(80%-120%)		
Nitrite-N	2500			2580	ug/L			103	(80%-120%)		
Sulfate	10000			10600	ug/L			106	(80%-120%)	06/06/17	01:59
QC1203802716	MB										
Chloride			U	67.0	ug/L					06/02/17	18:35
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1670535										
Nitrite-N			U	33.0	ug/L				MAR1	06/02/17	18:35
Sulfate			U	133	ug/L					06/06/17	01:31
QC1203802719	424518001	PS									
Chloride	5.00	D	1.44	D	6.72	mg/L	106	(75%-125%)		06/02/17	18:06
Fluoride	2.50	B	0.237		2.81	mg/L	103	(75%-125%)		06/02/17	14:15
Nitrate-N	2.50	D	0.843	D	3.53	mg/L	107	(75%-125%)		06/02/17	18:06
Nitrite-N	2.50	U	0.00		2.59	mg/L	103	(75%-125%)		06/02/17	14:15
Sulfate	10.0	D	2.74	D	13.6	mg/L	108	(75%-125%)		06/06/17	03:26

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- 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.
- N Spike 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

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424518

Page 3 of 3

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

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.

June 27, 2017

Radiological Analysis

June 27, 2017

Case Narrative

June 27, 2017

Radiochemistry

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL424518

Work Order #: 424518

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 18

Analytical Batch: 1670988

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518003	B39FM9
424518004	B39FN1
424518005	B39FR1
1203803798	Method Blank (MB)
1203803799	424518005(B39FR1) Sample Duplicate (DUP)
1203803800	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and duplicate, 1203803799 (B39FR1DUP) and 424518005 (B39FR1), did not meet the client relative error ratio requirement; however, both results are less than their respective MDCs.

Technical Information

Recounts

Samples 1203803799 (B39FR1DUP) and 424518003 (B39FM9) were recounted due to a suspected false positive. The recounts are reported. Sample 424518004 (B39FN1) was verified by recounting at least five days from the separation date. The recount is reported.

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001 REV# 19

Analytical Batch: 1670989

June 27, 2017

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518002	B39FC0
1203803801	Method Blank (MB)
1203803802	424658003(NonSDG) Sample Duplicate (DUP)
1203803803	424658003(NonSDG) Matrix Spike (MS)
1203803804	424658003(NonSDG) Matrix Spike Duplicate (MSD)
1203803805	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Matrix Spike and Matrix Spike Duplicate, 1203803803 (Non SDG 424658003MS) and 1203803804 (Non SDG 424658003MSD), do not meet the beta recovery requirement due to the sample activity being greater than five times the spiked nominal concentration.

Technical Information

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

Recounts

Sample 1203803801 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203803803 (Non SDG 424658003MS) and 1203803804 (Non SDG 424658003MSD), aliquots were reduced to conserve sample volume.

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

Analytical Procedure: GL-RAD-A-003 REV# 15

Analytical Batch: 1670749

June 27, 2017

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518002	B39FC0
424518003	B39FM9
424518004	B39FN1
424518005	B39FR1
1203803225	Method Blank (MB)
1203803226	424396002(NonSDG) Sample Duplicate (DUP)
1203803227	424396002(NonSDG) Matrix Spike (MS)
1203803228	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: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 22

Analytical Batch: 1674224

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424518002	B39FC0
424518003	B39FM9
424518004	B39FN1
424518005	B39FR1
1203811839	Method Blank (MB)
1203811840	425104003(NonSDG) Sample Duplicate (DUP)
1203811841	425104003(NonSDG) Matrix Spike (MS)
1203811842	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Sample 1203811842 (LCS) was recounted due to low recovery. The recount is reported.

June 27, 2017

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.

June 27, 2017

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: GEL424518 GEL Work Order: 424518

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: 22 JUN 2017

Title: Group Leader

Sample Data Summary

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518002	Date Collected: 05/31/2017 12:05	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FC0		Prep Basis: "As Received"
Batch ID: 1670989	Method: 9310_ALPHABETA_GPC	SOP Ref: GL-RAD-A-001
Run Date: 06/06/2017 18:18	Analyst: LXB3	Instrument: LB4100J3
Data File: AB1670989.xls	Aliquot: 150 mL	Count Time: 500 min
Prep Batch: 1670989	Prep Method: EPA 900.0/SW846 9310	
Prep Date: 06/06/2017 09:56		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA		2.55	pCi/L	+/-1.27	1.33	1.89	3.00
12587-47-2	Beta BETA		31.6	pCi/L	+/-1.42	5.38	1.14	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518002	Date Collected: 05/31/2017 12:05	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FC0	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 05:57	Aliquot: 60.03 mL	Instrument: LSCGREEN
Data File: C1670749.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1670749		
Prep Date: 06/09/2017 09:17		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		859	pCi/L	+/-33.7	163	31.5	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518002	Date Collected: 05/31/2017 12:05	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FC0	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 18:32	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1674224R2.xls	Prep Method: EPA 906.0 Modified	Count Time: 30 min
Prep Batch: 1674224		
Prep Date: 06/20/2017 12:47		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1160	pCi/L	+/-285	363	386	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518003	Date Collected: 06/01/2017 09:54	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FM9	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1670988	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 06/13/2017 08:09	Aliquot: 300 mL	Instrument: PIC4A
Data File: S1670988r3.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1670988		
Prep Date: 06/08/2017 13:48		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.819	pCi/L	+/-0.578	0.593	0.901	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.40	7.75	mg	95.5	(40%-110%)

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518003	Date Collected: 06/01/2017 09:54	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FM9	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 06:44	Aliquot: 60.05 mL	Instrument: LSCGREEN
Data File: C1670749.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1670749		
Prep Date: 06/09/2017 09:17		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		110	pCi/L	+/-20.9	29.1	31.4	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518003	Date Collected: 06/01/2017 09:54	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FM9	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 19:04	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1674224R2.xls	Prep Method: EPA 906.0 Modified	Count Time: 30 min
Prep Batch: 1674224		
Prep Date: 06/20/2017 12:47		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		1130	pCi/L	+/-281	356	381	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518004	Date Collected: 06/01/2017 09:18	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FN1	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1670988	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 06/14/2017 12:16	Aliquot: 300 mL	Instrument: PIC2D
Data File: S1670988r3.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1670988		
Prep Date: 06/08/2017 13:48		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		3.20	pCi/L	+/-0.956	1.08	1.26	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.10	7.75	mg	91.6	(40%-110%)

Comments:

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

The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518004	Date Collected: 06/01/2017 09:18	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FN1	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 07:31	Aliquot: 60.03 mL	Instrument: LSCGREEN
Data File: C1670749.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1670749		
Prep Date: 06/09/2017 09:17		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		809	pCi/L	+/-32.9	154	31.3	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518004	Date Collected: 06/01/2017 09:18	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FN1	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 19:35	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1674224R2.xls	Prep Method: EPA 906.0 Modified	Count Time: 30 min
Prep Batch: 1674224		
Prep Date: 06/20/2017 12:47		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		452	pCi/L	+/-241	257	379	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

Comments:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).
The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518005	Date Collected: 06/01/2017 12:12	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FR1	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1670988	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 06/12/2017 12:58	Aliquot: 300 mL	Instrument: PIC13D
Data File: S1670988r3.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1670988		
Prep Date: 06/08/2017 13:48		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	0.635	pCi/L	+/-0.599	0.607	0.973	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.20	7.75	mg	92.9	(40%-110%)

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518005	Date Collected: 06/01/2017 12:12	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FR1	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 08:18	Aliquot: 60.08 mL	Instrument: LSCGREEN
Data File: C1670749.xls	Prep Method: EPA EERF C-01 Modified	Count Time: 45 min
Prep Batch: 1670749		
Prep Date: 06/09/2017 09:17		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14762-75-5	Carbon-14		177	pCi/L	+/-22.4	39.8	31.4	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424518	Client: CPRC001	Project: CPRC0117006
Lab Sample ID: 424518005	Date Collected: 06/01/2017 12:12	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39FR1	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 20:06	Aliquot: 50 mL	Instrument: LSCGREEN
Data File: T1674224R2.xls	Prep Method: EPA 906.0 Modified	Count Time: 8.75 min
Prep Batch: 1674224		
Prep Date: 06/20/2017 12:47		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		2.61E+05	pCi/L	+/-5120	50600	605	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
---------------------------	--------	---------	-------	-----------	-------------------

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).
 The MDC is a sample specific MDC.

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 22, 2017
Page 1 of 3

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 424518

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1670988								
QC1203803798	MB								
Strontium-90			U	0.483	pCi/L			KSD1	06/12/1712:58
				Uncert: +/-0.464					
				TPU: +/-0.471					
**Strontium Carrier		7.75		6.50	mg	REC: 84	(40%-110%)		
QC1203803799	424518005	DUP							
Strontium-90		U	0.635	U	-0.309	pCi/L			06/14/1715:07
				Uncert: +/-0.599	+/-0.512	RPD: 0	N/A		
				TPU: +/-0.607	+/-0.512	RER: 2.33	(0-2)		
**Strontium Carrier		7.75	7.20	6.00	mg	REC: 77	(40%-110%)		
QC1203803800	LCS								
Strontium-90		72.9		71.5	pCi/L	REC: 98	(80%-120%)		06/12/1713:34
				Uncert: +/-3.17					
				TPU: +/-11.7					
**Strontium Carrier		7.75		7.60	mg	REC: 98	(40%-110%)		
Batch	1670989								
QC1203803801	MB								
Alpha			U	-0.337	pCi/L			LXB3	06/07/1712:39
				Uncert: +/-0.783					
				TPU: +/-0.784					
Beta			U	0.291	pCi/L				
				Uncert: +/-1.60					
				TPU: +/-1.60					
QC1203803802	424658003	DUP							
Alpha		U	3.30	4.91	pCi/L				06/06/1718:21
				Uncert: +/-2.70	+/-2.08	RPD: 39	(0% - 100%)		
				TPU: +/-2.82	+/-2.27	RER: 0.87	(0-2)		
Beta		14900		13800	pCi/L				
				Uncert: +/-29.0	+/-29.2	RPD: 8	(0% - 20%)		
				TPU: +/-2410	+/-2230	RER: 0.652	(0-2)		
QC1203803803	424658003	MS							
Alpha		483	U	3.30	375	pCi/L	REC: 78	(75%-125%)	06/06/1716:27
				Uncert: +/-2.70	+/-43.0				
				TPU: +/-2.82	+/-77.9				
Beta		1750	14900	19300	pCi/L	REC: N/A			
				Uncert: +/-29.0	+/-213				
				TPU: +/-2410	+/-3180				
QC1203803804	424658003	MSD							
Alpha		483	U	3.30	409	pCi/L	REC: 85	(75%-125%)	06/06/1716:27
				Uncert: +/-2.70	+/-50.3	RPD: 9	(0%-20%)		
				TPU: +/-2.82	+/-85.4	RER: 0.577	(0-2)		
Beta		1750	14900	22200	pCi/L	REC: N/A			
				Uncert: +/-29.0	+/-238	RPD: 14	(0%-20%)		
				TPU: +/-2410	+/-3610	RER: 1.16	(0-2)		
QC1203803805	LCS								

QC Summary

Workorder: 424518

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1670989								
Alpha	80.6			82.6	pCi/L	REC: 103	(80%-120%)		
	Uncert:			+/-8.91					
	TPU:			+/-16.3					
Beta	292			331	pCi/L	REC: 113	(80%-120%)		
	Uncert:			+/-12.0					
	TPU:			+/-57.6					
Rad Liquid Scintillation									
Batch	1670749								
QC1203803225	MB								
Carbon-14			U	-5.32	pCi/L			BXM4	06/10/1709:05
	Uncert:			+/-18.3					
	TPU:			+/-18.3					
QC1203803226	424396002	DUP							
Carbon-14		202		193	pCi/L				06/10/1709:52
	Uncert:	+/-22.9		+/-22.7		RPD: 5	(0% - 20%)		
	TPU:	+/-44.0		+/-42.3		RER: 0.317	(0-2)		
QC1203803227	424396002	MS							
Carbon-14	1250	202		1380	pCi/L	REC: 94	(75%-125%)		06/10/1710:39
	Uncert:	+/-22.9		+/-40.2					
	TPU:	+/-44.0		+/-259					
QC1203803228	LCS								
Carbon-14	1250			1170	pCi/L	REC: 94	(80%-120%)		06/10/1711:26
	Uncert:			+/-37.7					
	TPU:			+/-220					
Batch	1674224								
QC1203811839	MB								
Tritium			U	-60.9	pCi/L			BXM4	06/20/1723:58
	Uncert:			+/-211					
	TPU:			+/-211					
QC1203811840	425104003	DUP							
Tritium		2210		2010	pCi/L				06/21/1700:30
	Uncert:	+/-335		+/-327		RPD: 9	(0% - 20%)		
	TPU:	+/-543		+/-508		RER: 0.525	(0-2)		
QC1203811841	425104003	MS							
Tritium	2240	2210		4470	pCi/L	REC: 101	(75%-125%)		06/21/1701:01
	Uncert:	+/-335		+/-420					
	TPU:	+/-543		+/-961					
QC1203811842	LCS								
Tritium	2240			1820	pCi/L	REC: 82	(80%-120%)		06/22/1709:00
	Uncert:			+/-521					
	TPU:			+/-629					

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
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide

QC Summary

Workorder: 424518

Page 3 of 3

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
>						Result greater than quantifiable range or greater than upper limit of the analysis range				
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 $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample				
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 \geq 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.