



June 27, 2017

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

Re: CHPRC SAF I17-007
Work Order: 424516
SDG: GEL424516

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: I17-007-012, I17-007-013, I17-007-014, I17-007-015, I17-007-016, I17-007-017,
I17-007-018, I17-007-019, I17-007-020, I17-007-021, I17-007-022, I17-007-023, I17-007-024, I17-007-025,
I17-007-026, I17-007-027, I17-007-028, I17-007-029, I17-007-030, I17-007-031, I17-007-032, I17-007-033,
I17-007-034, I17-007-035, I17-007-036, I17-007-037, I17-007-038, I17-007-039, I17-007-040, I17-007-041,
I17-007-042, I17-007-043, I17-007-044 and I17-007-045

Enclosures



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Case Narrative

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General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF I17-007
SDG: GEL424516

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>
424516001	B39J54
424516002	B39J55
424516003	B39J56
424516004	B39J64
424516005	B39J65
424516006	B39J66
424516007	B39J57
424516008	B39J58
424516009	B39J59
424516010	B39J62
424516011	B39J63
424516012	B39J60
424516013	B39J61
424516014	B39J67
424516015	B39J68
424516016	B39J69
424516017	B39J70
424516018	B39J71
424516019	B39J72
424516020	B39J73
424516021	B39J74
424516022	B39J75

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424516023	B39J76
424516024	B39J77
424516025	B39J78
424516026	B39J79
424516027	B39J80
424516028	B39J81
424516029	B39J82
424516030	B39J83
424516031	B39J84
424516032	B39J86
424516033	B39J87
424516034	B39J85
424516035	B39J88
424516036	B39J89
424516037	B39J90

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, 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 #: GEL424516
Work Order #: 424516

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.

Calibration Information

Continuing Calibration Verification Requirements

The calibration verification standard requirements were not all met for sample . Tetrahydrofuran recovered at -20.4%D/drift in the daily CCV analyzed on 6/7/17. There were no positive results for any of the analytes that were outside the calibration criteria. The results are reported. 424516009 (B39J59).

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 (Non SDG 424245003PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (Non SDG 424245003PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

Technical Information

Sample Dilutions/Methanol Dilutions

Samples 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	424516		
	007	008	009
Carbon tetrachloride	5X	5X	5X
Chloroform	5X	5X	5X

Metals

Determination of Metals by ICP

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.

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. 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59).

Quality Control (QC) Information

Method Blank (MB) Statement

The samples in this SDG contained analytes at concentrations more than ten times the amount present in the method blank (See Below), therefore the data was not adversely affected.

Sample	Analyte	Value
1203802763 (MB)	Uranium	See applicable report

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

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.

General Chemistry

Carbon, Total Organic

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this

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report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Cyanide, Total

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 1203803260 (B39J57DUP), 1203803263 (B39J57MS), 1203803759 (B39J57MSD), 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	424516		
	007	008	009
Cyanide, Total	5X	5X	5X

Total Organic Halogens (TOX)

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 (MS)/Post Spike (PS) Recovery Statement

The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Total Organic Halogens	1203803540 (B39J57PS)	138* (75%-125%)

Technical Information

Sample Re-analysis

Samples were reanalyzed due to PS failure. The reanalysis results were even higher(145%), therefore the original data was reported.

Total Organic Halogens (TOX)

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.

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 (Non SDG 424518001DUP), 1203802719 (Non SDG 424518001PS), 424516004 (B39J64), 424516005 (B39J65) and 424516006 (B39J66) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	424516		
	004	005	006
Chloride	20X	20X	20X
Nitrate	20X	20X	20X

Sample Re-analysis

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

Hexavalent Chromium

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 1203802936 (B39J54DUP), 1203802937 (B39J54PS), 424516001 (B39J54), 424516002 (B39J55) and 424516003 (B39J56) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	424516		
	001	002	003
Hexavalent Chromium	2X	2X	2X

Radiochemistry

PUISO_PRECIP_AEA: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

Recounts

Sample 1203803280 (MB) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information

I129LL_SEP_LEPS_GS: COMMON (low level)

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.

GAMMA_GS: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

Recounts

Samples 424516023 (B39J76), 424516024 (B39J77) and 424516025 (B39J78) were recounted to verify results. The original counts are reported.

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

June 27, 2017

QC Information

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

Technical Information

Recounts

Sample 1203803799 (Non SDG 424518005DUP) was recounted due to a suspected false positive. The recount is reported. Samples 424516032 (B39J86), 424516033 (B39J87) and 424516034 (B39J85) were verified by recounting at least five days from the separation date. The recounts are 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.

TC99_EIE_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

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Recounts

Sample 1203803133 (LCS) was recounted due to low recovery. The recount is reported.

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

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.# 117-007-012
 Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

424516

Collector: Larry Rosane /CHPRC
 Contact/Requester: WATERS-HUSTED, K
 Telephone No. 376-4650
 SAF No. 117-007
 Sampling Origin: Hanford Site
 Purchase Order/Charge Code: 300071
 Project Title: Groundwater Background Study, April 20
 Logbook No. HNF-N-506 9285
 Ice Chest No. 605-615
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No. 77928184 9336
 Protocol: SURV
 Priority: 30 Days
 Priority: **PRIORITY**
 Offsite Property No. 7975

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.
 SPECIAL INSTRUCTIONS: Hold Time
 N/A
 Total Activity Exemption: Yes No

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39J54	N	W JUN 01 2017	0830	1x60-mL aG	7196_CR6: COMMON	24 Hours	Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Larry Rosane /CHPRC	Larry Rosane	JUN 01 2017	1400	FEDEX				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
				Received By	STACY BOONE	6/2/17	9:10	
				Relinquished By				
				Received By				

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 FSR ID = FSR8151
 A-6004-842 (REV 2)

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 424510				C.O.C.# 117-007-013 Page 1 of 1
Collector Larry Rosane JCH/PRC	Contact/Requester WATERS-HUSTED, K	Telephone No. 376-4650				
SAF No. 117-007	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071				
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/85	Ice Chest No. 605-615				
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 779281849336				
Protocol SURV	Priority: 30 Days	Offsite Property No. 7975				
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS N/A	Hold Time	Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Sample No. B39J55	Filter N	Date JUN 01 2017	No/Type Container 1x60-mL aG	Sample Analysis 7196_CR6: COMMON	Holding Time 24 Hours	Preservative Cool <=6C

Relinquished By Larry Rosane JCH/PRC	Print <i>Larry Rosane</i>	Sign <i>Larry Rosane</i>	Date/Time JUN 01 2017	Received By FEDEX	Print FEDEX	Sign <i>STACY BANNON</i>	Date/Time 6/2/17 9:10	Matrix * 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	Print FEDEX	Sign <i>FEDEX</i>	Date/Time JUN 01 2017	Received By FEDEX	Print FEDEX	Sign <i>STACY BANNON</i>	Date/Time 6/2/17 9:10	
Relinquished By	Print FEDEX	Sign <i>FEDEX</i>	Date/Time JUN 01 2017	Received By FEDEX	Print FEDEX	Sign <i>STACY BANNON</i>	Date/Time 6/2/17 9:10	
Relinquished By	Print FEDEX	Sign <i>FEDEX</i>	Date/Time JUN 01 2017	Received By FEDEX	Print FEDEX	Sign <i>STACY BANNON</i>	Date/Time 6/2/17 9:10	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 117-007-014
Larry Rosane /CHPRC		424516				Page 1 of 1
Collector	Larry Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	117-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	605-615
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281849336
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/JATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J56	N	W JUN 01 2017	0830	1x60-mL aG	7196_CR6: COMMON	24 Hours Cool <=6C

Relinquished By Larry Rosane /CHPRC	Print <i>Larry Rosane</i>	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix *
Relinquished By			Date/Time JUN 01 2017	Received By <i>ITy Bern STACY BOONE</i>			Date/Time 6/2/17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time FED EX	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# II17-007-019
Larry Rosane /GHPRC		424516				Page 1 of 1
Collector	Larry Rosane /GHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	II17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 921 85		Ice Chest No.	6005-615
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	77992 8184 9336
Protocol	SURV	Priority:	30 Days		Offsite Property No.	79975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B39J64	N	W JUN 01 2017	0830	1x125-mL G/P	9056_ANIONS_IC: COMMON	48 Hours
					Preservative	Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Larry Rosane /GHPRC		Jamy Rosane	JUN 01 2017 1400	FEDEX				
Relinquished By			Date/Time	Received By			Date/Time	
			FED 5K	STACY ROONE			6-2-17 9:00	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-020
		424516				Page 1 of 1
Collector Larry Rossana /CHPRC	I17-007	Contact/Requester WATERS-HUSTED, K	Telephone No. 376-4650			
SAF No.	Groundwater Background Study, April 20	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071			
Project Title	GEL Laboratories, LLC	Logbook No. HNF-N-506 92/ 85	Ice Chest No. 605-615			
Shipped To (Lab)	SURV	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 17192 81849336			
Protocol	POSSIBLE SAMPLE HAZARDS/REMARKS	Priority: 30 Days	Offsite Property No. 7975	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.						
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J65	N	W JUN 0 1 2017	0830	1x125-mL G/P	9056_ANIONS_IC: COMMON	Cool <=6C
SPECIAL INSTRUCTIONS		Hold Time	Holding Time	Preservative		
N/A			48 Hours	Cool <=6C		

Relinquished By Larry Rossana /CHPRC	Print Larry Rossana	Sign JUN 0 1 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time	Received By Hq Bom STACY BOONE			Date/Time 6/2/17 9:10	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
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time
PRINTED ON 4/12/2017				FSR ID = FSR8151				A-6004-842 (REV 2)

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# I17-007-021
Collector Larry Rosane /CHPRC		Contact/Requester WATERS-HUSTED, K		Telephone No. 376-4650		Page 1 of 1
SAF No. I17-007	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071		Ice Chest No. 6WS-61S		
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/ 85	Method of Shipment Commercial Carrier		Bill of Lading/Air Bill No. 7792 81849336		
Shipped To (Lab) GEL Laboratories, LLC	Priority: 30 Days	SPECIAL INSTRUCTIONS N/A		Offsite Property No. 7975		
Protocol SURV	POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		Hold Time		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No. B39J66	Filter N	Date JUN 01 2017	No/Type Container 1x125-mL G/P	Sample Analysis 9056_ANIONS_IC: COMMON	Holding Time 48 Hours	Preservative Cool <=6C

Relinquished By Larry Rosane /CHPRC	Print Larry Rosane	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FED EX	Received By STACY ROOPE			Date/Time 6/2/17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By	Date/Time

June 27, 2017

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C. # **I17-007-015**
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424516
 Telephone No. 376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. 605-999 559
 Bill of Lading/Air Bill No. 7292 8185 0281
 Offsite Property No. 17975

Contact/Requester **WATERS-HUSTED, K**
 Sampling Origin **Hanford Site**
 Logbook No. **HNF-N-506 9285**
 Method of Shipment **Commercial Carrier**
 Priority: **30 Days**
PRIORITY
 SPECIAL INSTRUCTIONS **Hold Time**
 N/A
 Total Activity Exemption: Yes No

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39J57	N	W	JUN 01 2017	0830	1x500-mL GIP	7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	28 Days	HNO3 to pH <2
B39J57	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J57	N	W			5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39J57	N	W			1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	FEDEX	Print	Sign	Date/Time	Matrix *
Larry Rosane /CHPRC			JUN 01 2017 1400						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				Received By				9:10	
Relinquished By				Received By				6/2/17	
Relinquished By				Received By					

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

PRINTED ON 4/12/2017
 FSR ID = FSR8151
 A-6004-842 (REV 2)

June 27, 2017

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 424500
 C.O.C.# I17-007-016
 Page 1 of 1

Collector: Larry Resane /CHPRC
 SAF No. I17-007
 Project Title: Groundwater Background Study, April 20
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: SURV
 Telephone No. 376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. 605-5944559
 Bill of Lading/Air Bill No. 779281850281
 Offsite Property No. 7975

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.
 SPECIAL INSTRUCTIONS: N/A
 Hold Time: 30 Days
 Priority: **PRIORITY**
 Total Activity Exemption: Yes No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39J58	N	JUN 01 2017	0830	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	28 Days	HNO3 to pH <2
B39J58	N			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J58	N			5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39J58	N			1x250-mL aG	9012_CYANIDE (TOTAL): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Larry Resane /CHPRC			1400	FEDEX				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
				ASB	STACY BOONE		6-2-17 9:10	

June 27, 2017

CH2M Hill Plateau Remediation Company		C.O.C. # I17-007-017			
Larry Rosane JCHPRC		Page 1 of 1			
Collector	Larry Rosane JCHPRC	Contact/Requester	WATERS-HUSTED, K		
SAF No.	I17-007	Sampling Origin	Hanford Site		
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92 / 85		
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		
Protocol	SURV	Priority:	30 Days		
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis
B39J59	N	W	JUN 01 2017 0830	1x500-mL G/P	7470_MERCURY_CV: COMMON (AQUEOUS); 6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04
B39J59	N	W		1x1-L aGs*	9020_TOX: COMMON
B39J59	N	W		5x40-mL aGs*	8260_VOA_GCMS: COMMON
B39J59	N	W		1x250-mL aG	9012_CYANIDE (TOTAL): COMMON
Relinquished By		Print	Sign	Date/Time	Received By
Larry Rosane JCHPRC		Larry Rosane	JUN 01 2017	1400	FEDEX
Relinquished By		Print	Sign	Date/Time	Received By
				FED 5X	STACY BAONE 6/2/17 9:10
Relinquished By		Print	Sign	Date/Time	Received By
Relinquished By		Print	Sign	Date/Time	Received By
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By
PRINTED ON 4/12/2017		FSR ID = FSR8151			A-6004-842 (REV 2)

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CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **I17-007-018**
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424516
 Telephone No. 376-4650
 Purchase Order/Charge Code 300071
 Ice Chest No. 605-615
 Bill of Lading/Air Bill No. 779281849386
 Offsite Property No. 7975

Contact/Requester **WATERS-HUSTED, K**
 Sampling Origin **Hanford Site**
 Logbook No. **HNF-N-506 921 85**
 Method of Shipment **Commercial Carrier**
 Priority: **30 Days**
PRIORITY
 SPECIAL INSTRUCTIONS **N/A**
 Hold Time
 Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39J62	N	W	JUN 01 2017	0830	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J62	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39J63	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J63	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39J60	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J60	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B39J61	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B39J61	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Larry Rosane /GIPRC			JUN 01 2017 1400	FEDEX				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

June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 424516		C.O.C.# 117-007-022 Page 1 of 1
Collector Larry Resane /CHPRC 117-007	Contact/Requester WATERS-HUSTED, K Hanford Site	Telephone No. 376-4650	Purchase Order/Charge Code 300071	
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/85	Ice Chest No. GWS-318	Bill of Lading/Air Bill No. 779281850178	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Offsite Property No. 7975		
Protocol SURV	Priority: 30 Days	SPECIAL INSTRUCTIONS N/A	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.				
Sample No. B99J67	Filter N	Date JUN 01 2017 0830	No/Type Container 1x1-L-P	Sample Analysis 9310_ALPHA BETA_GPC: COMMON
			Holding Time 6 Months	Preservative HNO3 to pH <2

Relinquished By Larry Resane /CHPRC	Print Larry Resane	Sign <i>Larry Resane</i>	Date/Time JUN 01 2017 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FED EX	Received By <i>ATY B STACY BOONE</i>			Date/Time 6-2-17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# I17-007-023
Larry Rosane / JCHPRC		424514				Page 1 of 1
Collector	Larry Rosane / JCHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GWS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
*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.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J68	N	W JUN 01 2017	0830	1x1-L-P	9310_ALPHA BETA_GPC: COMMON	HNO3 to pH <2

Relinquished By Larry Rosane / JCHPRC	Print <i>Larry Rosane</i>	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FSD EX	Received By <i>STACY BOONE</i>			Date/Time 6/2/17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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June 27, 2017

CH2M Hill Plateau Remediation Company		C.O.C.# II17-007-024	
424516		Page 1 of 1	
Collector Larry Rosane /CHPRC	117-007	Contact/Requester WATERS-HUSTED, K	Telephone No. 376-4650
SAF No.	Groundwater Background Study, April 20	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071
Project Title	GEL Laboratories, LLC	Logbook No. HNF-N-506 92/85	Ice Chest No. GWS-318
Shipped To (Lab)	SURV	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 779281850178
Protocol		Priority: 30 Days	Offsite Property No. 7975
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS N/A	Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No.	Filter	Date	Time
B39J69	N	W JUN 01 2017	0830
No/Type Container	1x1-L P	9310_ALPHA BETA_GPC: COMMON	Sample Analysis
Holding Time	6 Months		Preservative HNO3 to pH <2

Relinquished By Larry Rosane /CHPRC	Print Larry Rosane	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FED EX	Received By 158 STACY BOONT			Date/Time 6-2-17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		
PRINTED ON 4/12/2017		FSR ID = FSR8151		A-6004-842 (REV 2)				

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CH2M Hill Plateau Remediation Company				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST 4244516				C.O.C. # 117-007-025 Page 1 of 1	
Collector	Larry Rosana /CHPRC	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650	Purchase Order/Charge Code	300071		
SAF No.	117-007	Sampling Origin	Hanford Site	Logbook No.	HNF-N-506 92/85	Ice Chest No.	GWS-318		
Project Title	Groundwater Background Study, April 20	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	779281850178	Offsite Property No.	7975		
Shipped To (Lab)	GEL Laboratories, LLC	Priority:	30 Days	SPECIAL INSTRUCTIONS		Hold Time		Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Protocol	SURV			N/A					
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.									
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative	
B39J70	N		WJUN 01 2017	0850	1x250-ml P	TRITIUM_DIST_LSC: COMMON	6 Months	None	

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *	
Larry Rosana /CHPRC		John Rosana	JUN 01 2017	FEDEX			1400	S = Soil	DS = Drum Solids
Relinquished By				Received By			6/2/17 9:10	SE = Sediment	DL = Drum Liquids
				Received By				SO = Solid	T = Tissue
				Received By				SL = Sludge	WI = Wipe
				Received By				W = Water	L = Liquid
				Received By				O = Oil	V = Vegetation
				Received By				A = Air	X = Other
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)									
PRINTED ON 4/12/2017 FSR ID = FSR8151									

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CH2M Hill Plateau Remediation Company				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# I17-007-026 Page 1 of 1	
Collector	Larry Rosang /CHPRC	Contact/Requester	WATERS-HUSTED, K	Telephone No.	376-4650				
SAF No.	I17-007	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071				
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92 / 85	Ice Chest No.	GNS-318				
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	779281850178				
Protocol	SURV	Priority:	30 Days	Offsite Property No.	7975				
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.			SPECIAL INSTRUCTIONS N/A		Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative		
B39J71	N	W JUN 01 2017	0830	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None		

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *	
Larry Rosang /CHPRC		JUN 01 2017	1400	FEDEX				S = Soil	DS = Drum Solids
Relinquished By				Received By				SE = Sediment	DL = Drum Liquids
				ATYB - STACY BOONE				SO = Solid	T = Tissue
Relinquished By				Received By				SL = Sludge	WI = Wipe
				Received By				W = Water	L = Liquid
				Received By				O = Oil	V = Vegetation
				Received By				A = Air	X = Other
FINAL SAMPLE DISPOSITION								Disposal Method (e.g., Return to customer, per lab procedure, used in process)	
PRINTED ON 4/12/2017								Date/Time	
FSR ID = FSR8151								A-6004-842 (REV 2)	

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 117-007-027
Larry Resane /CHERC		424514				Page 1 of 1
Collector	Larry Resane /CHERC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	117-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GNS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J72	N	W JUN 01 2017	0830	1x250-mL P	TRITIUM_DIST_LSC: COMMON	6 Months None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Larry Resane /CHERC			1400	FEDEX				
Relinquished By				Received By				
				Larry Resane			6/21/17 9:10	
Relinquished By				Received By				
Relinquished By				Received By				
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		
PRINTED ON 4/12/2017		FSR ID = FSR8151		A-6004-842 (REV 2)				

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CH2M Hill Plateau Remediation Company		C.O.C. # I17-007-028	
424516		Page 1 of 1	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			
Collector Larry Rosane /CHPRC	Contact/Requester WATERS-HUSTED, K	Telephone No.	376-4650
SAF No. I17-007	Sampling Origin Hanford Site	Purchase Order/Charge Code	300071
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/85	Ice Chest No.	GWS-318
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.	779281850178
Protocol SURV	Priority: 30 Days	Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.			
SPECIAL INSTRUCTIONS N/A		Hold Time	
Sample No. B39J73	Filter N	Date W JUN 01 2017 0830	Time 0830
No./Type Container 1x500-mL G/P	Sample Analysis C14_LSC: COMMON	Holding Time 6 Months	Preservative None

Relinquished By Larry Rosane /CHPRC	Print <i>[Signature]</i>	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign <i>[Signature]</i>	Date/Time 6/2/17 9:10	Matrix *
Relinquished By				Received By <i>[Signature]</i>				S = Soil
Relinquished By				Received By				SE = Sediment
Relinquished By				Received By				SO = Solid
				Received By				SL = Sludge
				Received By				W = Water
				Received By				WI = Wipe
				Received By				L = Liquid
				Received By				V = Vegetation
				Received By				O = Oil
				Received By				A = Air
				Received By				X = Other
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-029
Larry Rosane /CHPRC		424516				Page 1 of 1
Collector	Larry Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92 / 85		Ice Chest No.	GWS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/HATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B99J74	N	W JUN 01 2017	0836	1x500-mL GP	C14_LSC: COMMON	6 Months
				Preservative	None	

Relinquished By Larry Rosane /CHPRC	Print Larry Rosane JUN 01 2017	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time Date/Time	Matrix *
Relinquished By			Date/Time FED EX	Received By JTB Buss STACY BOONE			Date/Time 6-2-17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time
PRINTED ON 4/12/2017				FSR ID = FSR8151		A-6004-842 (REV 2)		

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-030
Larry Rosane /CHPRC		424516				Page 1 of 1
Collector	Larry Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GWS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J75	N	JUN 01 2017	0830	1x500-mL G/P	C14_LSC: COMMON	6 Months None

Relinquished By Larry Rosane /CHPRC	Print <i>Larry Rosane</i>	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By			Date/Time FED EX	Received By <i>Stacy Boone</i>			Date/Time 6-2-17 9:10	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		
PRINTED ON 4/12/2017		FSR ID = FSR8151		A-6004-842 (REV 2)				

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June 27, 2017

CH2MHH Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 117-007-031
Larry Rosane /CHPRC		424516		Telephone No.	376-4650	Page 1 of 1
Collector	I17-007	Contact/Requester	WATERS-HUSTED, K		Purchase Order/Charge Code	300071
SAF No.	Groundwater Background Study, April 20	Sampling Origin	Hanford Site		Ice Chest No.	GW6-680
Project Title	GEL Laboratories, LLC	Logbook No.	HNF-N-506 92185		Bill of Lading/Air Bill No.	7792 81850204
Shipped To (Lab)	SURV	Method of Shipment	Commercial Carrier		Offsite Property No.	7975
Protocol	POSSIBLE SAMPLE HAZARDS/REMARKS	Priority:	30 Days		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.						
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J76	N	JUN 01 2017	0830	4x1-L G/P	GAMMA_GS: COMMON	6 Months HNO3 to pH <2
SPECIAL INSTRUCTIONS		Hold Time		N/A		

Relinquished By Larry Rosane /CHPRC	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Relinquished By			1400	FEDEX				S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			JUN 01 2017	Received By			6-2-17 9:10	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By				Received By				
Relinquished By				Received By				
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		
PRINTED ON 4/12/2017		FSR ID = FSR8151						A-6004-842 (REV 2)

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June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 117-007-032
Larry Resane / JC@PRC		424516				Page 1 of 1
Collector	Larry Resane / JC@PRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	117-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GWS-680
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	7792 8185 0204
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis
B39J77	N	W	JUN 01 2017	0830	4x1-L G/P	GAMMA_GS: COMMON
					4x1-L G/P	
						6 Months
						HNO3 to pH <2
						Preservative

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Larry Resane / JC@PRC			1400	FEDEX			
Relinquished By				Received By			
				STACY BOONE			6/2/17 9:10
Relinquished By				Received By			
Relinquished By				Received By			

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

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

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424514

CH2M Hill Plateau Remediation Company		C.O.C.# 117-007-033	
Collector Larry Rosane /CH2M		Page 1 of 1	
Contact/Requester WATERS-HUSTED, K		Telephone No. 376-4650	
Sampling Origin Hanford Site		Purchase Order/Charge Code 300071	
Project Title Groundwater Background Study, April 20		Ice Chest No. GWS-680	
Shipped To (Lab) GEL Laboratories, LLC		Bill of Lading/Air Bill No. 779281806204	
Protocol SURV		Offsite Property No. 79975	
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS Hold Time Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No.	Filter	Date	Time
B39J78	N	WJUN 01 2017	0830
No/Type Container 4x1-L G/P		GAMMA_GS: COMMON	
Sample Analysis		Holding Time 6 Months	
Preservative		HNO3 to pH <2	

June 27, 2017

Relinquished By Larry Rosane /CH2M	Print Larry Rosane	Sign [Signature]	Date/Time JUN 01 2017	Received By FEDEX	Print FEDEX	Sign [Signature]	Date/Time 1400
Relinquished By			Date/Time FED EX	Received By 1580M STACY BAUNTS			Date/Time 6-2-17 9:10
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time	

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company

C.O.C. # **I17-007-034**
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424514

Collector: Larry Rosane /CHPRC
 SAF No. I17-007
 Project Title: Groundwater Background Study, April 20
 Shipped To (Lab): **GEL Laboratories, LLC**
 Protocol: SURV

Contact/Requester: WATERS-HUSTED, K
 Telephone No. 376-4650
 Sampling Origin: Hanford Site
 Purchase Order/Charge Code: 300071
 Logbook No. HNF-N-506 **921 85**
 Method of Shipment: Commercial Carrier
 Ice Chest No. **GW S-318**
 Bill of Lading/Air Bill No. **77928188 0178**
 Priority: **30 Days**
 Offsite Property No. **79775**

PRIORITY

SPECIAL INSTRUCTIONS
 Hold Time: N/A
 Total Activity Exemption: Yes No

POSSIBLE SAMPLE HAZARDS/REMARKS
 *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39J79	N	W JUN 01 2017	0830	4x1-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Relinquished By Larry Rosane /CHPRC	Print	Sign	JUN 01 2017 1400	Received By FEDEX	Print	Sign		S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By STACY BOONE			6-2-17 9:10	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By	Date/Time

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CH2M Hill Plateau Remediation Company		C.O.C. # I17-007-035	
Lary Rosane /CHPRC		Page 1 of 1	
Collector	Lary Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K
SAF No.	I17-007	Telephone No.	376-4650
Project Title	Groundwater Background Study, April 20	Sampling Origin	Hanford Site
Shipped To (Lab)	GEL Laboratories, LLC	Logbook No.	HNF-N-506 92/85
Protocol	SURV	Method of Shipment	Commercial Carrier
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		Priority:	30 Days
SPECIAL INSTRUCTIONS N/A		Hold Time	
OFFSITE PROPERTY No. 79975		Bill of Lading/Air Bill No.	7792 8185 0204
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Sample No.	B39J80	Filter	N
Date	JUN 01 2017	Time	0630
No/Type Container	4X1-L G/P	Sample Analysis	I129LL_SEP_LEPS_GS_LL: COMMON
Holding Time	6 Months	Preservative	None

Relinquished By	Lary Rosane /CHPRC	Print	Y Rosane	Sign		Date/Time	JUN 01 2017	1400
Received By	FEDEX	Print	FEDEX	Sign		Date/Time		
Relinquished By		Print		Sign		Date/Time		
Received By	BY STACY BOONG	Print	BY STACY BOONG	Sign		Date/Time	6/21/17	9:10
Relinquished By		Print		Sign		Date/Time		
Received By		Print		Sign		Date/Time		

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # II7-007-036
		424516				Page 1 of 1
Collector Larry Rosane ICRP/PC	I17-007	Contact/Requester WATERS-HUSTED, K	Telephone No.	376-4650		
SAF No.		Sampling Origin Hanford Site	Purchase Order/Charge Code	300071		
Project Title Groundwater Background Study, April 20		Logbook No. HNF-N-506 92 / 85	Ice Chest No.	GWS-318		
Shipped To (Lab) GEL Laboratories, LLC		Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.	779281850178		
Protocol SURV		Priority: 30 Days	Offsite Property No.	79775		
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Total Activity Exemption: Yes <input type="checkbox"/> No <input type="checkbox"/>		
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B39J81	N	JUN 01 2017	0830	4x1-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months
						Preservative None

Relinquished By Larry Rosane ICRP/PC	Print Larry Rosane	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time
Relinquished By			Date/Time FED EX	Received By JLH Bm STACY BOONE			Date/Time 6/2/17 9:10
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			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

June 27, 2017

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-037
Larry Rosane /CHPRC		424516				Page 1 of 1
Collector	Larry Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92485		Ice Chest No.	GWS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*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.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B39J82	N	W JUN 01 2017	0830	1x1-L P	PUIISO_IE_PRECIP_AEA: COMMON	180 Days
						Preservative
						HNO3 to pH <2

Relinquished By Larry Rosane /CHPRC	Print <i>Larry Rosane</i>	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By			Date/Time FREDER	Received By <i>STACY BOONE</i>			Date/Time 6/2/17 9:10	
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time
PRINTED ON 4/12/2017				FSR ID = FSR8151				A-6004-842 (REV 2)

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CH2M Hill Plateau Remediation Company		C.O.C. # 117-007-038	
Collector Larry Rossano /C/PRC		Page 1 of 1	
SAF No. 117-007		Contact/Requester WATERS-HUSTED, K	Telephone No. 376-4650
Project Title Groundwater Background Study, April 20		Sampling Origin Hanford Site	Purchase Order/Charge Code 300071
Shipped To (Lab) GEL Laboratories, LLC		Logbook No. HNF-N-506 921 85	Ice Chest No. GWS-318
Protocol SURV		Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 779281850178
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		Priority: 30 Days	Offsite Property No. 7975
SPECIAL INSTRUCTIONS N/A		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No. B39J83	Filter N	* W	Time JUN 01 2017 0836
No/Type Container 1x1-L-P	Sample Analysis PUIISO_IE_PRECIP_AEA: COMMON	Holding Time 180 Days	Preservative HNO3 to pH <2

Relinquished By Larry Rossano /C/PRC	Print Larry Rossano JUN 01 2017	Sign	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time
Relinquished By			Date/Time FED 5K	Received By Hty Bm STACY BOOUE			Date/Time 6/2/17 9:10
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			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

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-039
Larry Roseane /CFPRC		424514				Page 1 of 1
Collector	Larry Roseane /CFPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GWS-318
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J84	N	JUN 01 2017	0830	1x1-L-P	PUIISO_IE_PRECIP_AEA: COMMON	HNO3 to pH <2

Relinquished By Larry Roseane /CFPRC	Print <i>Larry Roseane</i>	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print	Sign	Date/Time
Relinquished By			Date/Time FED EX	Received By <i>Stacy Boomb</i>			Date/Time 6-2-17 9:00
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			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

Disposed By

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CH2M Hill Plateau Remediation Company		C.O.C. # I17-007-040	
424516		Page 1 of 1	
Collector Larry Rosane /CHPRC	Contact/Requester WATERS-HUSTED, K	Telephone No. 376-4650	
SAF No. I17-007	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071	
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/85	Ice Chest No. GWS-318	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 779281850178	
Protocol SURV	Priority: 30 Days	Offsite Property No. 7975	
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS N/A	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No. B39J85	Filter N	Date JUN 01 2017	Time 0830
No/Type Container 1x1-L G/P	Sample Analysis SRISO_SEP_PRECIP_GPC: COMMON	Holding Time 6 Months	Preservative HNO3 to pH <2

Relinquished By Larry Rosane /CHPRC	Print <i>Larry Rosane</i>	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FED 5X	Received By <i>STACY BRONO</i>			Date/Time 6/2/17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # 117-007-041
		424516				Page 1 of 1
Collector Larry Rosane /CH2M	117-007	Contact/Requester WATERS-HUSTED, K	Telephone No.	376-4650		
SAF No.	Groundwater Background Study, April 20	Sampling Origin Hanford Site	Purchase Order/Charge Code	300071		
Project Title	GEL Laboratories, LLC	Logbook No.	HNF-N-506	92185	Ice Chest No.	GWS-318
Shipped To (Lab)	SURV	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178
Protocol		Priority:	30 Days	PRIORITY	Offsite Property No.	7975
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B39J86	N	WJUN 01 2017	0830	1x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	HNO3 to pH <2

Relinquished By Larry Rosane /CH2M	Print JUN 01 2017	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FEDEX	Received By 175 Bm STACY BOONS			Date/Time 6/2/17 9:10	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
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # I17-007-042	
Larry Rosane /CHPRC		424516				Page 1 of 1	
Collector	Larry Rosane /CHPRC	Contact/Requester	WATERS-HUSTED, K		Telephone No.	376-4650	
SAF No.	I17-007	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071	
Project Title	Groundwater Background Study, April 20	Logbook No.	HNF-N-506 92/85		Ice Chest No.	GWS-318	
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	779281850178	
Protocol	SURV	Priority:	30 Days		Offsite Property No.	7975	
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		N/A					
Sample No.	B39J87	Filter	N	Date	W JUN 01 2017 0830	Time	0830
No/Type Container	1x1-L G/P		Sample Analysis	SRISO_SEP_PRECIP_GPC: COMMON			
Holding Time	6 Months		Preservative	HNO3 to pH <2			

Relinquished By Larry Rosane /CHPRC	Print	Sign	Date/Time	Received By FEDEX	Print	Sign	Date/Time
Relinquished By			1400	Received By			
Relinquished By			6/2/17 9:10	Received By	Katy Bom STACY BOONE		
Relinquished By				Received By			
Relinquished By				Received By			

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
PRINTED ON 4/12/2017			

FRS ID = FSR8151

A-6004-842 (REV 2)

June 27, 2017

CH2M Hill Plateau Remediation Company		C.O.C.# 117-007-043	
Collector Larry Rosana JCHPRC		Page 1 of 1	
Contact/Requester WATERS-HUSTED, K		Telephone No. 376-4650	
SAF No. 117-007		Purchase Order/Charge Code 300071	
Project Title Groundwater Background Study, April 20		Ice Chest No. GWS-318	
Shipped To (Lab) GEL Laboratories, LLC		Bill of Lading/Air Bill No. 779281850178	
Protocol SURV		Offsite Property No. 7975	
POSSIBLE SAMPLE HAZARDS/REMARKS *Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
SPECIAL INSTRUCTIONS N/A		Hold Time	
Sample No. B39J88		Sample Analysis	
Filter * N		Holding Time 6 Months	
Date JUN 01 2017		Preservative HNO3 to pH <2	
Time 0830			
No./Type Container 1x500-mL G/P			
TC99_EIE_LSC: COMMON			

Relinquished By Larry Rosana JCHPRC	Print <i>Larry Rosana</i>	Sign JUN 01 2017	Date/Time 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time	Matrix *
Relinquished By			Date/Time 6/21/17 9:10	Received By <i>Stacy Boone</i>			Date/Time	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

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CH2M Hill Plateau Remediation Company		C.O.C.# I17-007-044	
Collector Larry Resane /CHPRC		Page 1 of 1	
SAF No. I17-007		Telephone No. 376-4650	
Project Title Groundwater Background Study, April 20		Purchase Order/Charge Code 300071	
Shipped To (Lab) GEL Laboratories, LLC		Ice Chest No. GWS-318	
Protocol SURV		Bill of Lading/Air Bill No. 779281850178	
Priority: 30 Days		Offsite Property No. 7975	
SPECIAL INSTRUCTIONS N/A		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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. B39J89	Filter * N	Date W JUN 01 2017 0830	Time
	No/Type Container 1x500-mL G/P	TC99_EIE_LSC: COMMON	Sample Analysis
	Received By FEDEX	Print	Sign
	Received By <i>Stacy Boonk</i>	Date/Time 6/2/17 9:10	Date/Time
	Received By	Date/Time	Date/Time
	Received By	Date/Time	Date/Time
	Received By	Date/Time	Date/Time
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)	
PRINTED ON 4/12/2017		Disposed By	

Relinquished By Larry Resane /CHPRC	Print <i>Jerry Resane</i>	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print	Sign	Date/Time	Matrix *
Relinquished By			Date/Time FED EX	Received By <i>Stacy Boonk</i>			Date/Time 6/2/17 9:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	

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June 27, 2017

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # I17-007-045
		424516		Page 1 of 1
Collector Larry Rosana /CHPRC	Contact/Requester WATERS-HUSTED, K	Telephone No.	376-4650	
SAF No. I17-007	Sampling Origin Hanford Site	Purchase Order/Charge Code	300071	
Project Title Groundwater Background Study, April 20	Logbook No. HNF-N-506 92/ 85	Ice Chest No.	GWS-318	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No.	779281850178	
Protocol SURV	Priority: 30 Days	Offsite Property No.	7975	
POSSIBLE SAMPLE HAZARDS/REMARKS		Hold Time	Total Activity Exemption: Yes <input type="checkbox"/> No <input type="checkbox"/>	
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.		SPECIAL INSTRUCTIONS N/A		
Sample No.	Filter	Date	Time	No/Type Container
B39190	N	W JUN 01 2017	0630	1x500-mL G/P
				TC99_EIE_LSC: COMMON
				Sample Analysis
				Holding Time
				6 Months
				Preservative
				HNO3 to pH <2

Relinquished By Larry Rosana /CHPRC	Print <i>Larry Rosana</i>	Sign	Date/Time JUN 01 2017 1400	Received By FEDEX	Print	Sign	Date/Time
Relinquished By			Date/Time FED EX	Received By <i>Stacy Boone</i>			Date/Time 6/21/17 9:10
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time
Date/Time							
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)			
PRINTED ON 4/12/2017				Disposed By			
				Date/Time			
Matrix *							
S	=	Soil	=	DS	=	Drum Solids	
SE	=	Sediment	=	DL	=	Drum Liquids	
SO	=	Solid	=	T	=	Tissue	
SL	=	Sludge	=	WI	=	Wipe	
W	=	Water	=	L	=	Liquid	
O	=	Oil	=	V	=	Vegetation	
A	=	Air	=	X	=	Other	

FSR ID = FSR8151

A-6004-842 (REV 2)

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

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL424516

Work Order #: 424516

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>
424516007	B39J57
424516008	B39J58
424516009	B39J59
1203806005	Method Blank (MB)
1203806006	Laboratory Control Sample (LCS)
1203806007	424245003(NonSDG) Post Spike (PS)
1203806008	424245003(NonSDG) 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 (Non SDG 424245003PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (Non SDG 424245003PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

Technical Information

Sample Dilutions/Methanol Dilutions

Samples 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59) were diluted because target analyte concentrations exceeded the calibration range.

June 27, 2017

Analyte	424516		
	007	008	009
Carbon tetrachloride	5X	5X	5X
Chloroform	5X	5X	5X

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: GEL424516 GEL Work Order: 424516

The Qualifiers in this report are defined as follows:

- 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
- 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.

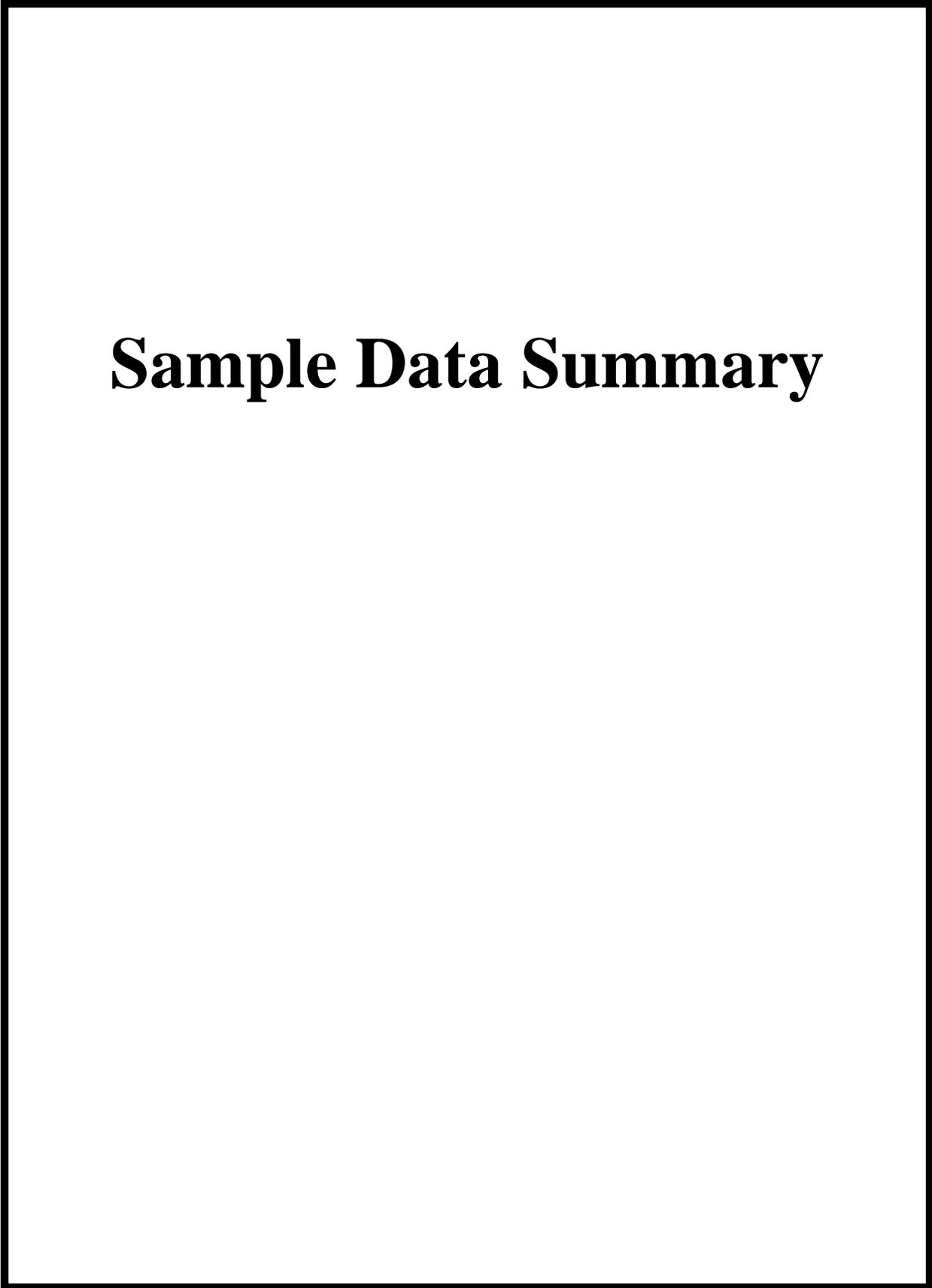
The following data validator verified the information presented in this data report:

Signature: 

Name: Erin Haubert

Date: 22 JUN 2017

Title: Data Validator



Sample Data Summary

June 27, 2017

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Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516007	Date Received: 06/02/2017 09:10	
Client ID: B39J57	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/07/2017 15:01	Inst: VOA3.I	Dilution: 1
Prep Date: 06/07/2017 15:01	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060717V3\3G311.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
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	J	1.98	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		97.2	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

Volatile

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**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516007	Date Received: 06/02/2017 09:10	
Client ID: B39J57DL	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/08/2017 13:51	Inst: VOA3.I	Dilution: 5
Prep Date: 06/08/2017 13:51	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060817V3\3G411.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	283	ug/L	1.50	10.0	5.00
67-66-3	Chloroform	D	135	ug/L	1.50	10.0	5.00

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Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516008	Date Received: 06/02/2017 09:10	
Client ID: B39J58	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/07/2017 15:32	Inst: VOA3.I	Dilution: 1
Prep Date: 06/07/2017 15:32	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060717V3\3G312.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
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	J	1.79	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		92.7	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

Volatile

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**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516008	Date Received: 06/02/2017 09:10	
Client ID: B39J58DL	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/08/2017 14:21	Inst: VOA3.I	Dilution: 5
Prep Date: 06/08/2017 14:21	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060817V3\3G412.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	278	ug/L	1.50	10.0	5.00
67-66-3	Chloroform	D	139	ug/L	1.50	10.0	5.00

June 27, 2017

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Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516009	Date Received: 06/02/2017 09:10	
Client ID: B39J59	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/07/2017 16:03	Inst: VOA3.I	Dilution: 1
Prep Date: 06/07/2017 16:03	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060717V3\3G313.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
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	U	1.60	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	J	1.88	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		96.2	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

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Volatile

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**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Date Collected: 06/01/2017 08:30	Matrix: WATER
Lab Sample ID: 424516009	Date Received: 06/02/2017 09:10	
Client ID: B39J59DL	Client: CPRC001	Project: CPRC0117007
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/08/2017 14:52	Inst: VOA3.I	Dilution: 5
Prep Date: 06/08/2017 14:52	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060817V3\3G413.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
56-23-5	Carbon tetrachloride	D	273	ug/L	1.50	10.0	5.00
67-66-3	Chloroform	D	139	ug/L	1.50	10.0	5.00

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 20, 2017

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CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424516

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%)			

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QC Summary

Workorder: 424516

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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%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	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%)			

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QC Summary

Workorder: 424516

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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						

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QC Summary

Workorder: 424516

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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						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	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						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	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%)			

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QC Summary

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Parname	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%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 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%)		

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QC Summary

Workorder: 424516

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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
Surrogate Recovery Report

SDG Number: GEL424516

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
424516007	B39J57	81	92	93
424516008	B39J58	79	92	92
424516009	B39J59	78	94	94
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
424516007	B39J57DL	75 D	89 D	95 D
424516008	B39J58DL	77 D	89 D	91 D
424516009	B39J59DL	74 D	88 D	91 D

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 #: GEL424516
Work Order #: 424516

Product: Determination of Metals by ICP-MS

Analytical Method: SW846 3005A/6020B

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

Analytical Batch: 1670552

Product: Determination of Metals by ICP

Analytical Method: SW846 3005A/6010D

Analytical Procedure: GL-MA-E-013 REV# 28

Analytical Batch: 1670560

Product: Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Analytical Method: 7470_HG_CVAA

Analytical Procedure: GL-MA-E-010 REV# 34

Analytical Batch: 1673467

Preparation Method: SW846 3005A

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

Preparation Batches: 1670551 and 1670559

Preparation Method: SW846 7470A Prep

Preparation Procedure: GL-MA-E-010 REV# 34

Preparation Batch: 1673466

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516007	B39J57
424516008	B39J58
424516009	B39J59
1203802783	Method Blank (MB) ICP
1203802784	Laboratory Control Sample (LCS)
1203802787	424516007(B39J57L) Serial Dilution (SD)
1203802785	424516007(B39J57S) Matrix Spike (MS)
1203802786	424516007(B39J57SD) Matrix Spike Duplicate (MSD)
1203802763	Method Blank (MB) ICP-MS
1203802764	Laboratory Control Sample (LCS)
1203802767	424516007(B39J57L) Serial Dilution (SD)
1203802765	424516007(B39J57S) Matrix Spike (MS)
1203802766	424516007(B39J57SD) Matrix Spike Duplicate (MSD)
1203810042	Method Blank (MB) CVAA
1203810043	Laboratory Control Sample (LCS)
1203810053	424516007(B39J57L) Serial Dilution (SD)
1203810049	424516007(B39J57D) Sample Duplicate (DUP)
1203810051	424516007(B39J57S) Matrix Spike (MS)

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.

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. 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59)-ICP-MS.

Quality Control (QC) Information

Method Blank (MB) Statement

The samples in this SDG contained analytes at concentrations more than ten times the amount present in the method blank (See Below), therefore the data was not adversely affected.

Sample	Analyte	Value
1203802763 (MB)	Uranium	See applicable report

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

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL424516 GEL Work Order: 424516

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).
- 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.
- 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:

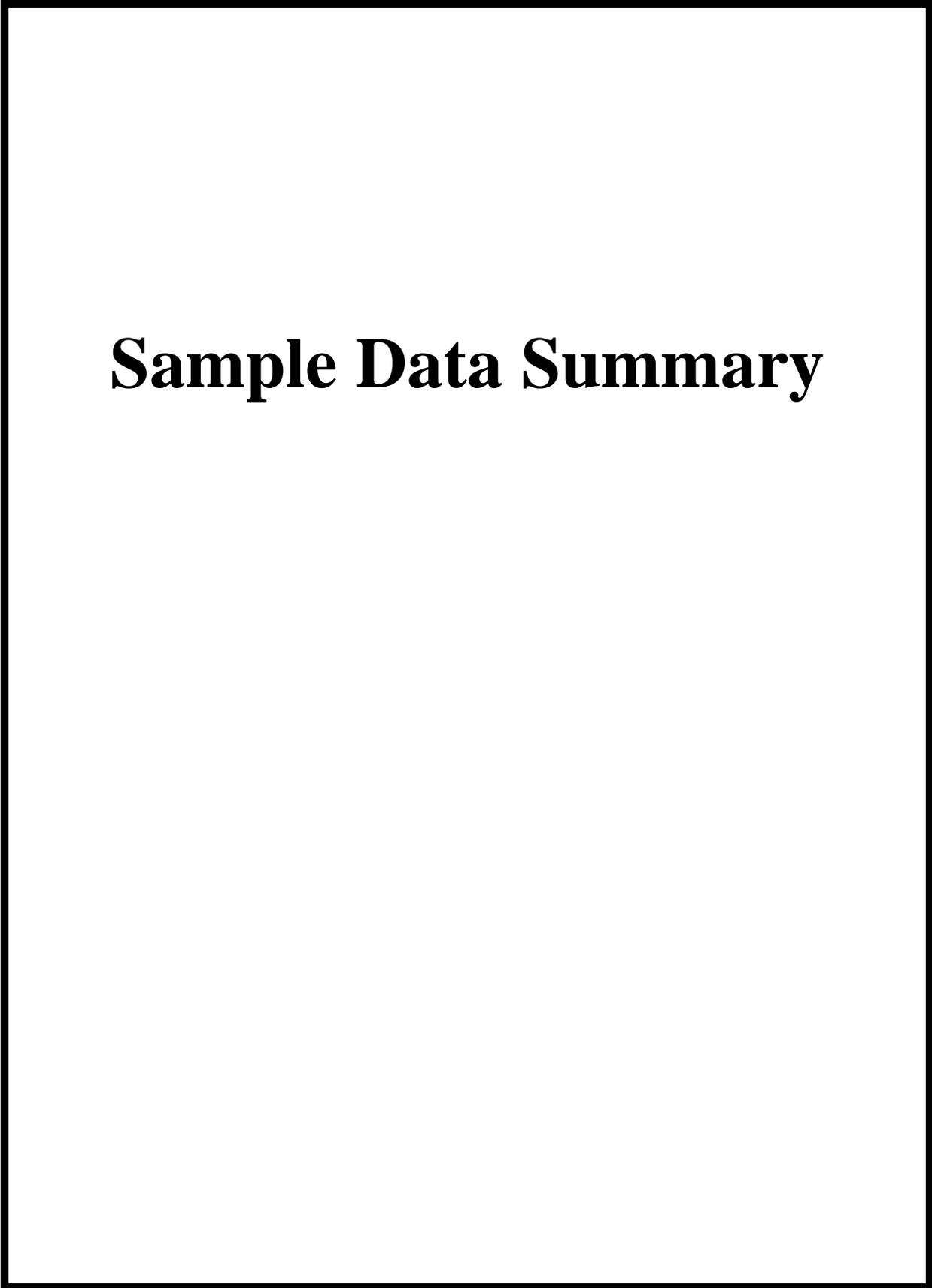
Signature:



Name: Nik-Cole Elmore

Date: 27 JUN 2017

Title: Data Validator



Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424516

CONTRACT: CPCR0117007

METHOD TYPE: SW846

SAMPLE ID: 424516007

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: B39J57

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
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 09:56	170622-13	1670552
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-39-3	Barium	0.670	ug/L	U	0.67	2	2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-41-7	Beryllium	5.85	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-42-8	Boron	53.2	ug/L		15	50	50	1	P	HSC	06/20/17 14:47	062017-1	1670560
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-70-2	Calcium	61.5	ug/L	B	50	200	200	1	P	HSC	06/20/17 14:47	062017-1	1670560
7440-47-3	Chromium	53.3	ug/L		3	10	10	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-48-4	Cobalt	53.6	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-50-8	Copper	54.4	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/17 14:47	062017-1	1670560
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	HSC	06/20/17 14:47	062017-1	1670560
7439-96-5	Manganese	47	ug/L		1	5	5	1	MS	BAJ	06/22/17 17:54	170622-4	1670552
7439-97-6	Mercury	5.19	ug/L		0.067	0.2	0.2	1	AV	MTM1	06/14/17 11:19	061417W1-14	1673467
7439-98-7	Molybdenum	0.20	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-02-0	Nickel	52	ug/L		0.6	2	2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	HSC	06/23/17 11:48	062317-2	1670560
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	HSC	06/20/17 14:47	062017-1	1670560
7440-24-6	Strontium	2	ug/L	U	2	10	10	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-29-1	Thorium	0.766	ug/L	B	0.7	2	2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-61-1	Uranium	299	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/17 00:43	170621-3	1670552
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	HSC	06/20/17 14:47	062017-1	1670560
7440-66-6	Zinc	49.8	ug/L		3.3	10	10	1	MS	BAJ	06/22/17 00:43	170621-3	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
1670560	1670559	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

1673467	1673466	SW846 7470A Prep	20	mL	20	mL	06/13/17	AXS5
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*Analytical Methods:

P SW846 3005A/6010D
MS SW846 3005A/6020B
AV SW846 7470A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424516

CONTRACT: CPCR0117007

METHOD TYPE: SW846

SAMPLE ID: 424516008

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: B39J58

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
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 10:01	170622-13	1670552
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-39-3	Barium	0.670	ug/L	U	0.67	2	2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-41-7	Beryllium	6.08	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-42-8	Boron	52.5	ug/L		15	50	50	1	P	HSC	06/20/17 15:00	062017-1	1670560
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	HSC	06/20/17 15:00	062017-1	1670560
7440-47-3	Chromium	53.7	ug/L		3	10	10	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-48-4	Cobalt	56.6	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-50-8	Copper	52.8	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/17 15:00	062017-1	1670560
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	HSC	06/20/17 15:00	062017-1	1670560
7439-96-5	Manganese	48.2	ug/L		1	5	5	1	MS	BAJ	06/22/17 18:01	170622-4	1670552
7439-97-6	Mercury	5.32	ug/L		0.067	0.2	0.2	1	AV	MTM1	06/14/17 11:31	061417W1-14	1673467
7439-98-7	Molybdenum	0.20	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-02-0	Nickel	54.1	ug/L		0.6	2	2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	HSC	06/23/17 12:01	062317-2	1670560
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	HSC	06/20/17 15:00	062017-1	1670560
7440-24-6	Strontium	2	ug/L	U	2	10	10	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-61-1	Uranium	302	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/17 01:05	170621-3	1670552
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	HSC	06/20/17 15:00	062017-1	1670560
7440-66-6	Zinc	53.4	ug/L		3.3	10	10	1	MS	BAJ	06/22/17 01:05	170621-3	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
1670560	1670559	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

1673467	1673466	SW846 7470A Prep	20	mL	20	mL	06/13/17	AXS5
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***Analytical Methods:**

P SW846 3005A/6010D
MS SW846 3005A/6020B
AV SW846 7470A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL424516

CONTRACT: CPRC0117007

METHOD TYPE: SW846

SAMPLE ID: 424516009

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: B39J59

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
7429-90-5	Aluminum	19.3	ug/L	U	19.3	50	50	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 10:03	170622-13	1670552
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-39-3	Barium	0.670	ug/L	U	0.67	2	2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-41-7	Beryllium	5.93	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-42-8	Boron	52.7	ug/L		15	50	50	1	P	HSC	06/20/17 15:03	062017-1	1670560
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-70-2	Calcium	50	ug/L	U	50	200	200	1	P	HSC	06/20/17 15:03	062017-1	1670560
7440-47-3	Chromium	52.9	ug/L		3	10	10	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-48-4	Cobalt	52.7	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-50-8	Copper	53.5	ug/L		0.3	1	1	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	06/20/17 15:03	062017-1	1670560
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7439-95-4	Magnesium	110	ug/L	U	110	300	300	1	P	HSC	06/20/17 15:03	062017-1	1670560
7439-96-5	Manganese	53.4	ug/L		1	5	5	1	MS	BAJ	06/22/17 18:02	170622-4	1670552
7439-97-6	Mercury	5.23	ug/L		0.067	0.2	0.2	1	AV	MTM1	06/14/17 11:33	061417W1-14	1673467
7439-98-7	Molybdenum	0.20	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-02-0	Nickel	52.4	ug/L		0.6	2	2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-09-7	Potassium	50	ug/L	U	50	150	150	1	P	HSC	06/23/17 12:04	062317-2	1670560
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-23-5	Sodium	100	ug/L	U	100	300	300	1	P	HSC	06/20/17 15:03	062017-1	1670560
7440-24-6	Strontium	2	ug/L	U	2	10	10	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-29-1	Thorium	0.70	ug/L	U	0.7	2	2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-61-1	Uranium	291	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/22/17 01:09	170621-3	1670552
7440-62-2	Vanadium	1	ug/L	U	1	5	5	1	P	HSC	06/20/17 15:03	062017-1	1670560
7440-66-6	Zinc	52.3	ug/L		3.3	10	10	1	MS	BAJ	06/22/17 01:09	170621-3	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
1670560	1670559	SW846 3005A	50	mL	50	mL	06/03/17	SXW1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

1673467	1673466	SW846 7470A Prep	20	mL	20	mL	06/13/17	AXS5
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***Analytical Methods:**

P **SW846 3005A/6010D**
MS **SW846 3005A/6020B**
AV **SW846 7470A**

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

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CH2M Hill Plateau Remediation Company
 MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424516

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
QC1203802764	LCS										
Aluminum	2000			2040	ug/L		102	(80%-120%)	BAJ	06/22/17	00:39
Antimony	50.0			48.8	ug/L		97.7	(80%-120%)		06/23/17	09:55
Arsenic	50.0			52.3	ug/L		105	(80%-120%)		06/22/17	00:39
Barium	50.0			50.2	ug/L		100	(80%-120%)			
Beryllium	50.0			55.4	ug/L		111	(80%-120%)			
Cadmium	50.0			50.0	ug/L		99.9	(80%-120%)			
Chromium	50.0			50.9	ug/L		102	(80%-120%)			
Cobalt	50.0			52.3	ug/L		105	(80%-120%)			
Copper	50.0			50.9	ug/L		102	(80%-120%)			
Lead	50.0			50.8	ug/L		102	(80%-120%)			
Manganese	50.0			51.7	ug/L		103	(80%-120%)		06/22/17	17:53
Molybdenum	50.0			49.4	ug/L		98.7	(80%-120%)		06/22/17	00:39
Nickel	50.0			49.3	ug/L		98.6	(80%-120%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Selenium	50.0			51.6	ug/L		103	(80%-120%)	BAJ	06/22/17	00:39
Silver	50.0			50.8	ug/L		102	(80%-120%)			
Strontium	50.0			48.7	ug/L		97.4	(80%-120%)			
Thallium	50.0			48.2	ug/L		96.4	(80%-120%)			
Thorium	50.0			49.5	ug/L		98.9	(80%-120%)			
Tin	50.0			49.4	ug/L		98.8	(80%-120%)			
Uranium	50.0			49.5	ug/L		99.1	(80%-120%)			
Zinc	50.0			53.5	ug/L		107	(80%-120%)			
QC1203802763	MB										
Aluminum			U	19.3	ug/L					06/22/17	00:36
Antimony			U	1.00	ug/L					06/23/17	09:54
Arsenic			U	2.00	ug/L					06/22/17	00:36
Barium			U	0.670	ug/L						
Beryllium			U	0.200	ug/L						
Cadmium			U	0.300	ug/L						
Chromium			U	3.00	ug/L						

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Cobalt			U	0.300	ug/L				BAJ	06/22/17	00:36
Copper			U	0.300	ug/L						
Lead			U	0.500	ug/L						
Manganese			U	1.00	ug/L					06/22/17	17:51
Molybdenum			U	0.200	ug/L					06/22/17	00:36
Nickel			U	0.600	ug/L						
Selenium			U	2.00	ug/L						
Silver			U	0.300	ug/L						
Strontium			U	2.00	ug/L						
Thallium			U	0.600	ug/L						
Thorium			U	0.700	ug/L						
Tin			U	1.00	ug/L						
Uranium				0.272	ug/L						
Zinc			U	3.30	ug/L						
QC1203802765 424516007 MS											
Aluminum	2000	U	19.3	2110	ug/L		105	(75%-125%)		06/22/17	00:46

June 27, 2017

GEL LABORATORIES LLC

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Antimony	50.0	U	1.00	48.0	ug/L		95.8	(75%-125%)	BAJ	06/23/17	09:58
Arsenic	50.0	U	2.00	50.3	ug/L		97.9	(75%-125%)		06/22/17	00:46
Barium	50.0	U	0.670	48.2	ug/L		96.2	(75%-125%)			
Beryllium	50.0		5.85	64.3	ug/L		117	(75%-125%)			
Cadmium	50.0	U	0.300	51.3	ug/L		103	(75%-125%)			
Chromium	50.0		53.3	106	ug/L		106	(75%-125%)			
Cobalt	50.0		53.6	109	ug/L		111	(75%-125%)			
Copper	50.0		54.4	108	ug/L		107	(75%-125%)			
Lead	50.0	U	0.500	48.7	ug/L		97.2	(75%-125%)			
Manganese	50.0		47.0	94.2	ug/L		94.4	(75%-125%)		06/22/17	17:55
Molybdenum	50.0	U	0.200	50.4	ug/L		101	(75%-125%)		06/22/17	00:46
Nickel	50.0		52.0	107	ug/L		111	(75%-125%)			
Selenium	50.0	U	2.00	48.7	ug/L		97.3	(75%-125%)			
Silver	50.0	U	0.300	52.8	ug/L		105	(75%-125%)			
Strontium	50.0	U	2.00	50.3	ug/L		100	(75%-125%)			

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Thallium	50.0	U	0.600	46.2	ug/L		92.2	(75%-125%)	BAJ	06/22/17	00:46
Thorium	50.0	B	0.766	48.6	ug/L		95.6	(75%-125%)			
Tin	50.0	U	1.00	50.2	ug/L		99.9	(75%-125%)			
Uranium	50.0	C	299	340	ug/L		N/A	(75%-125%)			
Zinc	50.0		49.8	101	ug/L		101	(75%-125%)			
QC1203802766 424516007 MSD											
Aluminum	2000	U	19.3	2110	ug/L	0.0295	105	(0%-20%)		06/22/17	00:49
Antimony	50.0	U	1.00	52.1	ug/L	8.16	104	(0%-20%)		06/23/17	09:59
Arsenic	50.0	U	2.00	51.7	ug/L	2.78	101	(0%-20%)		06/22/17	00:49
Barium	50.0	U	0.670	50.1	ug/L	3.69	99.8	(0%-20%)			
Beryllium	50.0		5.85	66.8	ug/L	3.88	122	(0%-20%)			
Cadmium	50.0	U	0.300	50.1	ug/L	2.36	100	(0%-20%)			
Chromium	50.0		53.3	107	ug/L	0.804	108	(0%-20%)			
Cobalt	50.0		53.6	110	ug/L	1.13	113	(0%-20%)			
Copper	50.0		54.4	111	ug/L	3.09	114	(0%-20%)			
Lead	50.0	U	0.500	49.8	ug/L	2.24	99.4	(0%-20%)			

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GEL LABORATORIES LLC

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Manganese	50.0		47.0	99.7	ug/L	5.67	105	(0%-20%)	BAJ	06/22/17	17:57
Molybdenum	50.0	U	0.200	49.7	ug/L	1.34	99.3	(0%-20%)		06/22/17	00:49
Nickel	50.0		52.0	110	ug/L	2.16	116	(0%-20%)			
Selenium	50.0	U	2.00	50.3	ug/L	3.23	100	(0%-20%)			
Silver	50.0	U	0.300	52.3	ug/L	0.971	104	(0%-20%)			
Strontium	50.0	U	2.00	49.5	ug/L	1.64	98.3	(0%-20%)			
Thallium	50.0	U	0.600	47.7	ug/L	3.1	95.1	(0%-20%)			
Thorium	50.0	B	0.766	49.1	ug/L	1.05	96.7	(0%-20%)			
Tin	50.0	U	1.00	49.5	ug/L	1.28	98.6	(0%-20%)			
Uranium	50.0	C	299	341	ug/L	0.353	N/A	(0%-20%)			
Zinc	50.0		49.8	101	ug/L	0.725	103	(0%-20%)			
QC1203802767 424516007 SDILT											
Aluminum		U	8.14	DU	96.5	ug/L	N/A	(0%-20%)		06/22/17	00:56
Antimony		U	0.097	DU	5.00	ug/L	N/A	(0%-20%)		06/23/17	10:00
Arsenic		U	1.32	DU	10.0	ug/L	N/A	(0%-20%)		06/22/17	00:56
Barium		U	0.132	DU	3.35	ug/L	N/A	(0%-20%)			

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Beryllium		5.85	D	1.08	ug/L	7.91		(0%-20%)	BAJ	06/22/17	00:56
Cadmium	U	0.037	DU	1.50	ug/L	N/A		(0%-20%)			
Chromium		53.3	D	10.0	ug/L	5.85		(0%-20%)			
Cobalt		53.6	D	10.1	ug/L	5.54		(0%-20%)			
Copper		54.4	D	10.1	ug/L	6.96		(0%-20%)			
Lead	U	0.122	DU	2.50	ug/L	N/A		(0%-20%)			
Manganese		47.0	D	9.43	ug/L	.313		(0%-20%)		06/22/17	17:59
Molybdenum	U	0.110	DU	1.00	ug/L	N/A		(0%-20%)		06/22/17	00:56
Nickel		52.0	D	9.57	ug/L	7.89		(0%-20%)			
Selenium	U	0.085	DU	10.0	ug/L	N/A		(0%-20%)			
Silver	U	0.025	DU	1.50	ug/L	N/A		(0%-20%)			
Strontium	U	0.308	DU	10.0	ug/L	N/A		(0%-20%)			
Thallium	U	0.155	DU	3.00	ug/L	N/A		(0%-20%)			
Thorium	B	0.766	DU	3.50	ug/L	N/A		(0%-20%)			
Tin	U	0.222	DU	5.00	ug/L	N/A		(0%-20%)			

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GEL LABORATORIES LLC

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1670552										
Uranium	C	299	D	58.5	ug/L	2.15		(0%-20%)	BAJ	06/22/17	00:56
Zinc		49.8	D	12.1	ug/L	21.7		(0%-20%)			
Metals Analysis-ICP											
Batch	1670560										
QC1203802784	LCS										
Boron	500			506	ug/L		101	(80%-120%)	HSC	06/20/17	14:44
Calcium	5000			4990	ug/L		99.7	(80%-120%)			
Iron	5000			5410	ug/L		108	(80%-120%)			
Magnesium	5000			5130	ug/L		103	(80%-120%)			
Potassium	5000			5050	ug/L		101	(80%-120%)		06/23/17	11:45
Sodium	5000			5690	ug/L		114	(80%-120%)		06/20/17	14:44
Vanadium	500			499	ug/L		99.7	(80%-120%)			
QC1203802783	MB										
Boron			U	15.0	ug/L					06/20/17	14:41
Calcium			U	50.0	ug/L						
Iron			U	30.0	ug/L						
Magnesium			U	110	ug/L						
Potassium			U	50.0	ug/L					06/23/17	11:42

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GEL LABORATORIES LLC

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1670560										
Sodium			U	100	ug/L				HSC	06/20/17	14:41
Vanadium			U	1.00	ug/L						
QC1203802785 424516007 MS											
Boron	500		53.2	548	ug/L		99	(75%-125%)		06/20/17	14:50
Calcium	5000	B	61.5	4880	ug/L		96.4	(75%-125%)			
Iron	5000	U	30.0	5220	ug/L		104	(75%-125%)			
Magnesium	5000	U	110	5000	ug/L		100	(75%-125%)			
Potassium	5000	U	50.0	5050	ug/L		101	(75%-125%)		06/23/17	11:51
Sodium	5000	U	100	5380	ug/L		107	(75%-125%)		06/20/17	14:50
Vanadium	500	U	1.00	491	ug/L		98.1	(75%-125%)			
QC1203802786 424516007 MSD											
Boron	500		53.2	556	ug/L	1.38	100	(0%-20%)		06/20/17	14:54
Calcium	5000	B	61.5	4940	ug/L	1.21	97.6	(0%-20%)			
Iron	5000	U	30.0	5220	ug/L	0.0536	104	(0%-20%)			
Magnesium	5000	U	110	5010	ug/L	0.266	100	(0%-20%)			
Potassium	5000	U	50.0	5060	ug/L	0.372	101	(0%-20%)		06/23/17	11:55
Sodium	5000	U	100	5320	ug/L	1.03	105	(0%-20%)		06/20/17	14:54

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1670560										
Vanadium	500	U	1.00	495	ug/L	0.921	99	(0%-20%)	HSC	06/20/17	14:54
QC1203802787 424516007 SDILT											
Boron			53.2 DU	75.0	ug/L	N/A		(0%-20%)		06/20/17	14:57
Calcium		B	61.5 DU	250	ug/L	N/A		(0%-20%)			
Iron		U	5.26 DU	150	ug/L	N/A		(0%-20%)			
Magnesium		U	-8.1 DU	550	ug/L	N/A		(0%-20%)			
Potassium		U	7.94 DU	250	ug/L	N/A		(0%-20%)		06/23/17	11:58
Sodium		U	50.1 BD	-131	ug/L	N/A		(0%-20%)		06/20/17	14:57
Vanadium		U	0.206 DU	5.00	ug/L	N/A		(0%-20%)			
Metals Analysis-Mercury											
Batch	1673467										
QC1203810049 424516007 DUP											
Mercury			5.19	5.06	ug/L	2.4		(0%-20%)	MTM1	06/14/17	11:21
QC1203810043 LCS											
Mercury	2.00			2.12	ug/L		106	(80%-120%)		06/14/17	11:06
QC1203810042 MB											
Mercury			U	0.067	ug/L					06/14/17	11:01
QC1203810051 424516007 MS											
Mercury	2.00		5.19	7.33	ug/L		107	(75%-125%)		06/14/17	11:26

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QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-Mercury											
Batch	1673467										
	QC1203810053	424516007	SDILT								
Mercury		5.19	D	1.08	ug/L	3.66		(0%-10%)	MTM1	06/14/17	11:28

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.

June 27, 2017

General Chem Analysis

June 27, 2017

Case Narrative

June 27, 2017

General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL424516
Work Order #: 424516

Product: Carbon, Total Organic

Analytical Method: SW846 9060A

Analytical Procedure: GL-GC-E-093 REV# 15

Analytical Batch: 1670679

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516010	B39J62
424516011	B39J63
424516012	B39J60
424516013	B39J61
1203803827	Method Blank (MB)
1203803828	Laboratory Control Sample (LCS)
1203803829	424516010(B39J62) Sample Duplicate (DUP)
1203803831	424516010(B39J62) Post Spike (PS)

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: Cyanide, Total

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 19

Analytical Batches: 1670760 and 1670759

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516007	B39J57
424516008	B39J58
424516009	B39J59
1203803257	Method Blank (MB)
1203803258	Laboratory Control Sample (LCS)
1203803260	424516007(B39J57) Sample Duplicate (DUP)
1203803263	424516007(B39J57) Matrix Spike (MS)
1203803759	424516007(B39J57) 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.

Technical Information

Sample Dilutions

The following samples 1203803260 (B39J57DUP), 1203803263 (B39J57MS), 1203803759 (B39J57MSD), 424516007 (B39J57), 424516008 (B39J58) and 424516009 (B39J59) 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	424516		
	007	008	009
Cyanide, Total	5X	5X	5X

Product: Total Organic Halogens (TOX)
Analytical Method: 9020_TOX
Analytical Procedure: GL-GC-E-007 REV# 14
Analytical Batches: 1670887 and 1673012

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516007	B39J57
424516008	B39J58
424516009	B39J59
424516010	B39J62
424516011	B39J63
424516012	B39J60
424516013	B39J61
1203803537	Method Blank (MB)
1203803538	Laboratory Control Sample (LCS)
1203803539	424516007(B39J57) Sample Duplicate (DUP)
1203803540	424516007(B39J57) Post Spike (PS)
1203808921	Method Blank (MB)
1203808922	Laboratory Control Sample (LCS)
1203808923	424516011(B39J63) Sample Duplicate (DUP)
1203808924	424516011(B39J63) 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.

Quality Control (QC) Information

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Total Organic Halogens	1203803540 (B39J57PS)	138* (75%-125%)

Technical Information

Sample Re-analysis

Samples were reanalyzed due to PS failure. The reanalysis results were even higher(145%), therefore the original data was reported.

Miscellaneous Information

Additional Comments

A pair of nitrate wash blanks is analyzed at the start of the batch. Although they are designated as ICB, they are performed for calculating purposes only. The value of the nitrate wash blanks are averaged and subtracted from all samples. Neither of these values should exceed 0.6 ug Cl. The PQL limit typically applied to ICB results does not apply in this application, since the results are used only to determine background concentrations and are subtracted from all calculated results.

Breakthrough effect

Breakthrough effect: If the value for a sample is greater than the reporting limit (10 ug/L), the result for the second slug should not be greater than 25% of the combined value of the first and second slug. Results which do not meet these criteria are designated with a "Fail" comment in the Breakthrough effect column on the Logbook page; however, the "fail" designation is not applicable for samples with a result of less than 10 ug/L.

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>
424516004	B39J64
424516005	B39J65
424516006	B39J66
1203802716	Method Blank (MB)
1203802717	Laboratory Control Sample (LCS)
1203802718	424518001(NonSDG) Sample Duplicate (DUP)
1203802719	424518001(NonSDG) 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 (Non SDG 424518001DUP), 1203802719 (Non SDG 424518001PS), 424516004 (B39J64), 424516005 (B39J65) and 424516006 (B39J66) 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	424516		
	004	005	006
Chloride	20X	20X	20X
Nitrate	20X	20X	20X

Sample Re-analysis

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

Product: Hexavalent Chromium

Analytical Method: 7196_CR6

Analytical Procedure: GL-GC-E-044 REV# 22

Analytical Batch: 1670635

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516001	B39J54
424516002	B39J55
424516003	B39J56
1203802934	Method Blank (MB)
1203802935	Laboratory Control Sample (LCS)
1203802936	424516001(B39J54) Sample Duplicate (DUP)
1203802937	424516001(B39J54) 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 1203802936 (B39J54DUP), 1203802937 (B39J54PS), 424516001 (B39J54), 424516002 (B39J55) and 424516003 (B39J56) 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	424516		
	001	002	003
Hexavalent Chromium	2X	2X	2X

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

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL424516 GEL Work Order: 424516

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).

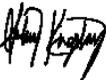
D Results are reported from a diluted aliquot of sample.

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.

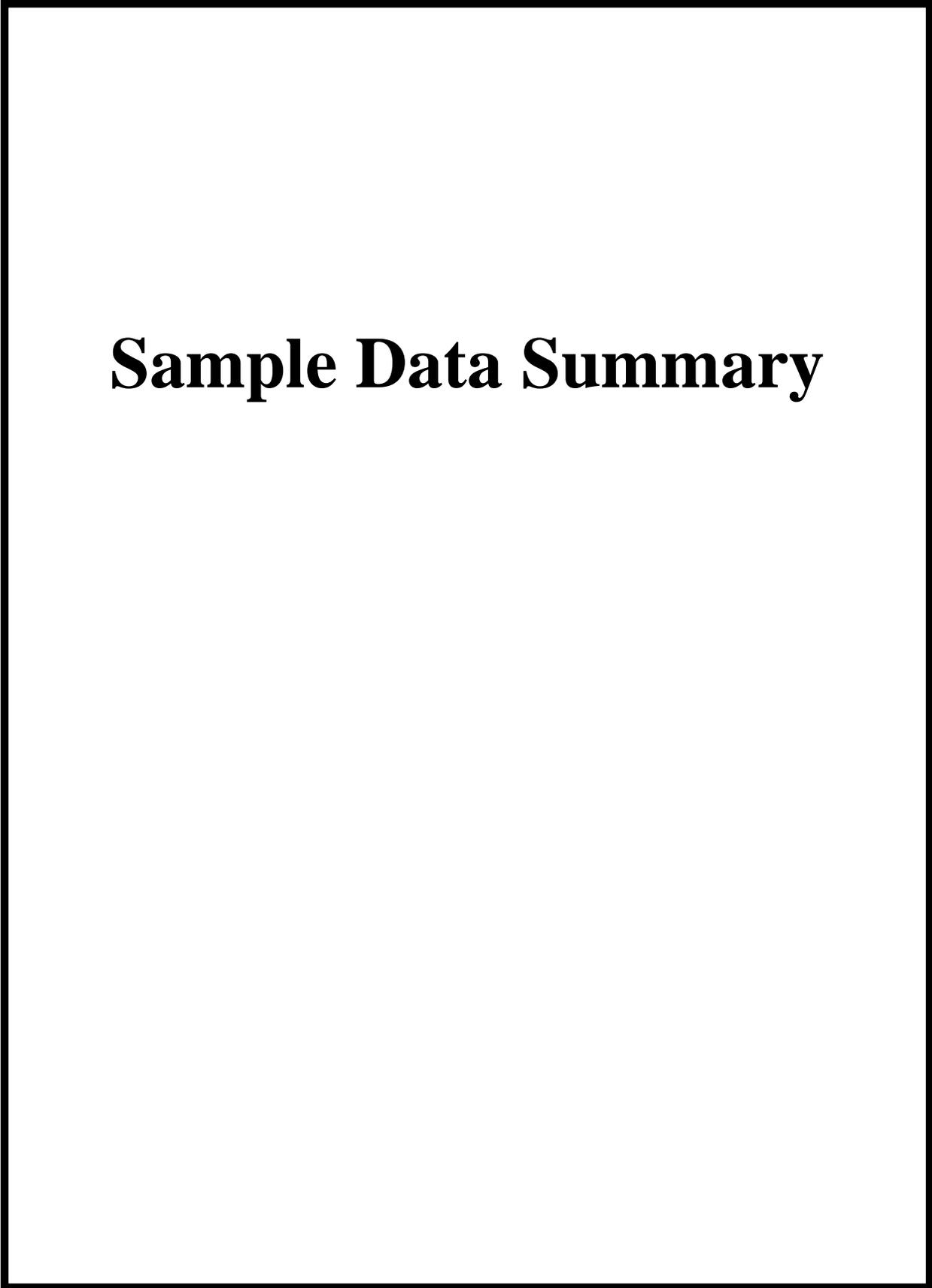
The following data validator verified the information presented in this data report:

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 I17-007

Client Sample ID: B39J54	Project: CPRC0117007
Sample ID: 424516001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
7196_CR6: COMMON "As Received"												
Hexavalent Chromium	D	0.113	0.006	0.020	mg/L		2	VH1	06/02/17	1123	1670635	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	7196_CR6		

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

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 I17-007

Client Sample ID: B39J55	Project: CPRC0117007
Sample ID: 424516002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
7196_CR6: COMMON "As Received"												
Hexavalent Chromium	D	0.131	0.006	0.020	mg/L		2	VH1	06/02/17	1123	1670635	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	7196_CR6		

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

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 I17-007

Client Sample ID: B39J56	Project: CPRC0117007
Sample ID: 424516003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
7196_CR6: COMMON "As Received"												
Hexavalent Chromium	D	0.106	0.006	0.020	mg/L		2	VH1	06/02/17	1124	1670635	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	7196_CR6		

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

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 I17-007

Client Sample ID: B39J64	Project: CPRC0I17007
Sample ID: 424516004	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
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		3530	33.0	500	ug/L		1	MAR1	06/02/17	1150	1670535	1
Nitrite-N		615	33.0	250	ug/L		1					
Sulfate		15000	133	500	ug/L		1					
Chloride	D	34100	1340	4000	ug/L		20	MAR1	06/02/17	1443	1670535	2
Nitrate-N	D	46600	660	2000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	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

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 I17-007

Client Sample ID: B39J65	Project: CPRC0I17007
Sample ID: 424516005	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
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		3490	33.0	500	ug/L		1	MAR1	06/02/17	1219	1670535	1
Nitrite-N		616	33.0	250	ug/L		1					
Sulfate		15000	133	500	ug/L		1					
Chloride	D	34000	1340	4000	ug/L		20	MAR1	06/02/17	1512	1670535	2
Nitrate-N	D	46400	660	2000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	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

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 I17-007

Client Sample ID: B39J66	Project: CPRC0I17007
Sample ID: 424516006	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
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		3500	33.0	500	ug/L		1	MAR1	06/02/17	1248	1670535	1
Nitrite-N		616	33.0	250	ug/L		1					
Sulfate		15000	133	500	ug/L		1					
Chloride	D	33800	1340	4000	ug/L		20	MAR1	06/02/17	1541	1670535	2
Nitrate-N	D	46400	660	2000	ug/L		20					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9056_ANIONS_IC	
2	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

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 I17-007

Client Sample ID: B39J57	Project: CPRC0I17007
Sample ID: 424516007	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	205	8.35	25.0	ug/L	1.00	5	AXH3	06/07/17	0901	1670760	1
Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		363	3.33	10.0	ug/L		1	RMJ	06/08/17	1925	1670887	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/07/17	0710	1670759

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9020_TOX	

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

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 I17-007

Client Sample ID: B39J58	Project: CPRC0I17007
Sample ID: 424516008	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	222	8.35	25.0	ug/L	1.00	5	AXH3	06/07/17	0905	1670760	1
Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		341	3.33	10.0	ug/L		1	RMJ	06/08/17	2104	1670887	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/07/17	0710	1670759

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9020_TOX	

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 |

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 I17-007

Client Sample ID: B39J59	Project: CPRC0I17007
Sample ID: 424516009	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	216	8.35	25.0	ug/L	1.00	5	AXH3	06/07/17	0910	1670760	1
Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		368	3.33	10.0	ug/L		1	RMJ	06/08/17	2210	1670887	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/07/17	0710	1670759

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9020_TOX	

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

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 I17-007

Client Sample ID: B39J62	Project: CPRC0117007
Sample ID: 424516010	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1		2440	330	1000	ug/L		1	TSM	06/09/17	1736	1670679	1
Total Organic Carbon #2		2320	330	1000	ug/L		1					
Total Organic Carbon #3		2290	330	1000	ug/L		1					
Total Organic Carbon #4		2290	330	1000	ug/L		1					
Total Organic Carbon Average		2330	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		190	3.33	10.0	ug/L		1	RMJ	06/08/17	2254	1670887	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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

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 I17-007

Client Sample ID: B39J63	Project: CPRC0I17007
Sample ID: 424516011	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1		2380	330	1000	ug/L		1	TSM	06/09/17	1956	1670679	1
Total Organic Carbon #2		2350	330	1000	ug/L		1					
Total Organic Carbon #3		2360	330	1000	ug/L		1					
Total Organic Carbon #4		2360	330	1000	ug/L		1					
Total Organic Carbon Average		2360	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		202	3.33	10.0	ug/L		1	RMJ	06/09/17	1846	1673012	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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

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 I17-007

Client Sample ID: B39J60	Project: CPRC0I17007
Sample ID: 424516012	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1		2310	330	1000	ug/L		1	TSM	06/09/17	2043	1670679	1
Total Organic Carbon #2		2330	330	1000	ug/L		1					
Total Organic Carbon #3		2350	330	1000	ug/L		1					
Total Organic Carbon #4		2340	330	1000	ug/L		1					
Total Organic Carbon Average		2340	330	1000	ug/L		1					
Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		193	3.33	10.0	ug/L		1	RMJ	06/09/17	2024	1673012	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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

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 I17-007

Client Sample ID: B39J61	Project: CPRC0I17007
Sample ID: 424516013	Client ID: CPRC001
Matrix: WATER	
Collect Date: 01-JUN-17 08:30	
Receive Date: 02-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060_TOX: COMMON "As Received"												
Total Organic Carbon #1		2340	330	1000	ug/L		1	TSM	06/09/17	2130	1670679	1
Total Organic Carbon #2		2350	330	1000	ug/L		1					
Total Organic Carbon #3		2370	330	1000	ug/L		1					
Total Organic Carbon #4		2380	330	1000	ug/L		1					
Total Organic Carbon Average		2360	330	1000	ug/L		1					

Halogen Analysis												
9020_TOX: COMMON "As Received"												
Total Organic Halogens		197	3.33	10.0	ug/L		1	RMJ	06/09/17	2125	1673012	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424516

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1670679										
QC1203803829	424516010	DUP									
Total Organic Carbon Average		2330		2340	ug/L	0.171 ^		(+/-1000)	TSM	06/09/17	18:23
QC1203803828	LCS										
Total Organic Carbon Average	10000			10400	ug/L		104	(80%-120%)		06/09/17	17:24
QC1203803827	MB										
Total Organic Carbon Average			U	330	ug/L					06/09/17	17:12
QC1203803831	424516010	PS									
Total Organic Carbon Average	10.0	2.33		14.3	mg/L		119	(75%-125%)		06/09/17	19:10
Flow Injection Analysis											
Batch	1670760										
QC1203803260	424516007	DUP									
Cyanide, Total		D	205 D	209	ug/L	2.18		(0%-20%)	AXH3	06/07/17	09:02
QC1203803258	LCS										
Cyanide, Total	50.0			50.9	ug/L		102	(80%-120%)		06/07/17	08:28
QC1203803257	MB										
Cyanide, Total			U	1.67	ug/L					06/07/17	08:27
QC1203803263	424516007	MS									
Cyanide, Total	100	D	205 D	307	ug/L		103	(75%-125%)		06/07/17	09:03
QC1203803759	424516007	MSD									
Cyanide, Total	100	D	205 D	316	ug/L	2.73	111	(0%-20%)		06/07/17	09:04

June 27, 2017 GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Halogen Analysis											
Batch 1670887											
QC1203803539	424516007	DUP									
Total Organic Halogens		363		350	ug/L	3.6		(0%-20%)	RMJ	06/08/17	19:42
QC1203803538	LCS										
Total Organic Halogens	100			98.8	ug/L		98.8	(80%-120%)		06/08/17	19:03
QC1203803537	MB										
Total Organic Halogens			U	3.33	ug/L					06/08/17	18:43
QC1203803540	424516007	PS									
Total Organic Halogens	100	363		501	ug/L		138*	(75%-125%)		06/08/17	20:23
Batch 1673012											
QC1203808923	424516011	DUP									
Total Organic Halogens		202		199	ug/L	1.54		(0%-20%)	RMJ	06/09/17	19:05
QC1203808922	LCS										
Total Organic Halogens	100			97.2	ug/L		97.2	(80%-120%)		06/09/17	18:26
QC1203808921	MB										
Total Organic Halogens			U	3.33	ug/L					06/09/17	18:04
QC1203808924	424516011	PS									
Total Organic Halogens	100	202		300	ug/L		97.9	(75%-125%)		06/09/17	19:43
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

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1670535										
Nitrite-N		U	33.0	U	33.0	ug/L	N/A		MAR1	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					
Nitrite-N			U		33.0	ug/L					
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

June 27, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1670535										
Nitrite-N	2.50	U	0.00		2.59	mg/L	103	(75%-125%)	MAR1	06/02/17	14:15
Sulfate	10.0	D	2.74	D	13.6	mg/L	108	(75%-125%)		06/06/17	03:26
Spectrometric Analysis											
Batch	1670635										
QC1203802936	424516001	DUP									
Hexavalent Chromium		D	0.113	D	0.115	mg/L	1.69	(0%-20%)	VH1	06/02/17	11:23
QC1203802935	LCS										
Hexavalent Chromium	0.050				0.0489	mg/L	97.8	(80%-120%)		06/02/17	11:23
QC1203802934	MB										
Hexavalent Chromium			U		0.003	mg/L				06/02/17	11:18
QC1203802937	424516001	PS									
Hexavalent Chromium	0.050	D	0.0566	D	0.0943	mg/L	75.3	(75%-125%)		06/02/17	11:23

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: 424516

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Radiological Analysis

Case Narrative

June 27, 2017

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL424516
Work Order #: 424516

Product: PUIISO_PRECIP_AEA:COMMON
Analytical Method: PUIISO_PRECIP_AEA
Analytical Procedure: GL-RAD-A-011 REV# 26
Analytical Batch: 1670768

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516029	B39J82
424516030	B39J83
424516031	B39J84
1203803280	Method Blank (MB)
1203803281	424516029(B39J82) Sample Duplicate (DUP)
1203803282	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 1203803280 (MB) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information

1. Sample 424516030 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

Product: I129LL_SEP_LEPS_GS: COMMON (low level)
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1671427

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516026	B39J79
424516027	B39J80

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424516028	B39J81
1203804805	Method Blank (MB)
1203804806	424692001(NonSDG) Sample Duplicate (DUP)
1203804807	424692001(NonSDG) Matrix Spike (MS)
1203804808	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.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Results are considered a false positive due to no valid peak.	Iodine-129	424516027	B39J80
			424516028	B39J81

Product: GAMMA_GS:COMMON

Analytical Method: 901.1_GAMMA_GS

Analytical Procedure: GL-RAD-A-013 REV# 27

Analytical Batch: 1675360

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516023	B39J76
424516024	B39J77
424516025	B39J78
1203814555	Method Blank (MB)
1203814556	424516023(B39J76) Sample Duplicate (DUP)
1203814557	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

June 27, 2017

Samples 424516023 (B39J76), 424516024 (B39J77) and 424516025 (B39J78) were recounted to verify results. The original counts are reported.

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>
424516032	B39J86
424516033	B39J87
424516034	B39J85
1203803798	Method Blank (MB)
1203803799	424518005(NonSDG) 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 (Non SDG 424518005DUP), did not meet the client relative error ratio requirement; however, both results are less than their respective MDCs.

Technical Information

Recounts

Sample 1203803799 (Non SDG 424518005DUP) was recounted due to a suspected false positive. The recount is reported. Samples 424516032 (B39J86), 424516033 (B39J87) and 424516034 (B39J85) were verified by recounting at least five days from the separation date. The recounts are 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>
424516014	B39J67
424516015	B39J68
424516016	B39J69
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: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 5

Analytical Batch: 1670715

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>
424516035	B39J88
424516036	B39J89
424516037	B39J90
1203803131	Method Blank (MB)
1203803132	424396002(NonSDG) Sample Duplicate (DUP)
1203803133	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 1203803133 (LCS) was recounted due to low recovery. The recount is reported.

Product: C14_LSC: COMMON

Analytical Method: C14_LSC

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

Analytical Batch: 1670749

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424516020	B39J73
424516021	B39J74
424516022	B39J75
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.

June 27, 2017

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>
424516017	B39J70
424516018	B39J71
424516019	B39J72
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.

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: GEL424516 GEL Work Order: 424516

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.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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: Kate Gellatly

Date: 23 JUN 2017

Title: Analyst I

Sample Data Summary

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516014	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J67		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: LB410014
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		79.2	pCi/L	+/-4.37	13.6	2.32	3.00
12587-47-2	Beta BETA		58.6	pCi/L	+/-1.78	9.77	1.02	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516015	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J68		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: LB4100J1
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		91.4	pCi/L	+/-4.58	15.7	1.93	3.00
12587-47-2	Beta BETA		60.9	pCi/L	+/-1.85	10.2	1.12	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516016	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J69	Method: 9310_ALPHABETA_GPC	Prep Basis: "As Received"
Batch ID: 1670989	Analyst: LXB3	SOP Ref: GL-RAD-A-001
Run Date: 06/06/2017 18:18	Aliquot: 150 mL	Instrument: LB4100J2
Data File: AB1670989.xls	Prep Method: EPA 900.0/SW846 9310	Count Time: 500 min
Prep Batch: 1670989		
Prep Date: 06/06/2017 09:56		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA		79.5	pCi/L	+/-4.43	13.7	2.27	3.00
12587-47-2	Beta BETA		57.5	pCi/L	+/-1.80	9.55	1.07	4.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516017	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J70	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 16:57	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		1170	pCi/L	+/-283	363	381	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516018	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J71	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 17:29	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		1180	pCi/L	+/-285	366	383	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516019	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J72	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1674224	Analyst: BXM4	SOP Ref: GL-RAD-A-002
Run Date: 06/20/2017 18:01	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		1170	pCi/L	+/-284	362	382	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516020	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J73	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 00:11	Aliquot: 60.01 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		606	pCi/L	+/-29.9	116	31.3	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516021	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J74	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 04:23	Aliquot: 60.07 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		631	pCi/L	+/-30.3	121	31.3	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516022	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J75	Method: C14_LSC	Prep Basis: "As Received"
Batch ID: 1670749	Analyst: BXM4	SOP Ref: GL-RAD-A-003
Run Date: 06/10/2017 05:10	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		588	pCi/L	+/-29.7	113	31.3	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516
 Lab Sample ID: 424516023

 Client ID: B39J76
 Batch ID: 1675360
 Run Date: 06/21/2017 12:48
 Data File: G424516023.CNF;1
 Prep Batch: 1675360
 Prep Date: 06/21/2017 00:00

Client: CPRC001
 Date Collected: 06/01/2017 08:30
 Date Received: 06/02/2017 09:10

 Method: 901.1_GAMMA_GS
 Analyst: MXR1
 Aliquot: 0.5 L
 Prep Method: EPA 901.1

Project: CPRC0117007
 Matrix: WATER

 Prep Basis: "As Received"
 SOP Ref: GL-RAD-A-013
 Instrument: GAM14
 Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137		107	pCi/L	+/-15.3	16.1	10.7	15.0
10198-40-0	Cobalt-60		110	pCi/L	+/-16.2	16.8	6.59	
14683-23-9	Europium-152	U	-5.64	pCi/L	+/-11.6	11.8	21.0	
15585-10-1	Europium-154	U	6.37	pCi/L	+/-11.2	11.5	26.4	
14391-16-3	Europium-155	U	-5.07	pCi/L	+/-13.5	13.7	23.3	

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516
 Lab Sample ID: 424516024

 Client ID: B39J77
 Batch ID: 1675360
 Run Date: 06/21/2017 12:49
 Data File: G424516024.CNF;1
 Prep Batch: 1675360
 Prep Date: 06/21/2017 00:00

Client: CPRC001
 Date Collected: 06/01/2017 08:30
 Date Received: 06/02/2017 09:10

 Method: 901.1_GAMMA_GS
 Analyst: MXR1
 Aliquot: 0.5 L
 Prep Method: EPA 901.1

Project: CPRC0117007
 Matrix: WATER

 Prep Basis: "As Received"
 SOP Ref: GL-RAD-A-013
 Instrument: GAM16
 Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137		122	pCi/L	+/-15.8	16.8	10.1	15.0
10198-40-0	Cobalt-60		111	pCi/L	+/-17.5	18.1	6.31	
14683-23-9	Europium-152	U	-8.43	pCi/L	+/-12.8	13.4	22.5	
15585-10-1	Europium-154	U	1.14	pCi/L	+/-13.9	13.9	26.3	
14391-16-3	Europium-155	U	-1.2	pCi/L	+/-14.5	14.5	24.5	

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516
 Lab Sample ID: 424516025

 Client ID: B39J78
 Batch ID: 1675360
 Run Date: 06/21/2017 12:49
 Data File: G424516025.CNF;1
 Prep Batch: 1675360
 Prep Date: 06/21/2017 00:00

Client: CPRC001
 Date Collected: 06/01/2017 08:30
 Date Received: 06/02/2017 09:10

 Method: 901.1_GAMMA_GS
 Analyst: MXR1
 Aliquot: 0.5 L
 Prep Method: EPA 901.1

Project: CPRC0117007
 Matrix: WATER

 Prep Basis: "As Received"
 SOP Ref: GL-RAD-A-013
 Instrument: GAM27
 Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137		123	pCi/L	+/-15.9	17.0	7.11	15.0
10198-40-0	Cobalt-60		107	pCi/L	+/-15.4	16.1	8.51	
14683-23-9	Europium-152	U	-2.64	pCi/L	+/-11.6	11.6	21.0	
15585-10-1	Europium-154	U	-1.76	pCi/L	+/-12.0	12.0	22.9	
14391-16-3	Europium-155	U	15.4	pCi/L	+/-11.9	13.8	23.0	

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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516026	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J79	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1671427	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 06/08/2017 13:19	Aliquot: 1.6 L	Instrument: XRAY3
Data File: I424516026.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 60 min
Prep Batch: 1671427		
Prep Date: 06/07/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		1.33	pCi/L	+/-0.793	0.804	0.701	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
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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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516027	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J80	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1671427	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 06/08/2017 13:20	Aliquot: 1.6 L	Instrument: XRAY5
Data File: I424516027.CNF;2	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 75 min
Prep Batch: 1671427		
Prep Date: 06/07/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	UX	0.00	pCi/L	+/-0.940	0.950	0.850	1.00

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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516028	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J81	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: "As Received"
Batch ID: 1671427	Analyst: MJH1	SOP Ref: GL-RAD-A-006
Run Date: 06/08/2017 13:20	Aliquot: 1.6 L	Instrument: XRAY6
Data File: I424516028.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 60 min
Prep Batch: 1671427		
Prep Date: 06/07/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	UX	0.00	pCi/L	+/-0.789	0.802	0.721	1.00

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.
 - X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516029	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J82	Method: PUIISO_PRECIP_AEA	Prep Basis: "As Received"
Batch ID: 1670768	Analyst: HAKB	SOP Ref: GL-RAD-A-011
Run Date: 06/20/2017 12:27	Aliquot: 0.1 L	Instrument: 1209
Data File: S0424516029_PU.1A.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 240 min
Prep Batch: 1670768		
Prep Date: 06/20/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	-0.0327	pCi/L	+/-0.282	0.283	0.654	1.00
OER-100-70	Plutonium-239/240		12.3	pCi/L	+/-2.58	3.35	1.06	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	12.3	19.7	pCi/L	62.3	(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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516030	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J83	Method: PUIISO_PRECIP_AEA	Prep Basis: "As Received"
Batch ID: 1670768	Analyst: HAKB	SOP Ref: GL-RAD-A-011
Run Date: 06/20/2017 12:27	Aliquot: 0.1 L	Instrument: 1214
Data File: S0424516030_PU.1A.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 240 min
Prep Batch: 1670768		
Prep Date: 06/20/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	-0.0713	pCi/L	+/-0.215	0.216	0.605	1.00
OER-100-70	Plutonium-239/240		11.1	pCi/L	+/-2.07	2.66	0.652	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	16.0	19.7	pCi/L	81.1	(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).
 The MDC is a sample specific MDC.

June 27, 2017

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Rad,
Certificate of Analysis
Sample Summary

SDG Number: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516031	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J84	Method: PUIISO_PRECIP_AEA	Prep Basis: "As Received"
Batch ID: 1670768	Analyst: HAKB	SOP Ref: GL-RAD-A-011
Run Date: 06/20/2017 12:27	Aliquot: 0.1 L	Instrument: 1215
Data File: S0424516031_PU.1A.gcnf	Prep Method: DOE EML HASL-300, Pu-11-	Count Time: 240 min
Prep Batch: 1670768		
Prep Date: 06/20/2017 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
I3981-16-3	Plutonium-238	U	0.00	pCi/L	+/-0.262	0.263	0.390	1.00
OER-100-70	Plutonium-239/240		11.8	pCi/L	+/-2.44	3.16	0.389	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Plutonium-242 Tracer	13.6	19.7	pCi/L	68.9	(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).
 The MDC is a sample specific MDC.

June 27, 2017

**Certificate of Analysis
Sample Summary**

SDG Number: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516032	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J86	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: PIC1D
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		5.07	pCi/L	+/-0.977	1.26	1.01	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.00	7.75	mg	90.3	(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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516033	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J87	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: PIC2A
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		4.98	pCi/L	+/-0.905	1.22	0.739	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.80	7.75	mg	87.7	(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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516034	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J85	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: PIC2B
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		3.79	pCi/L	+/-0.875	1.08	0.884	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.60	7.75	mg	85.2	(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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516035	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J88	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1670715	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 06/11/2017 06:26	Aliquot: 100 mL	Instrument: LSCSILVER
Data File: E1670715R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1670715		
Prep Date: 06/06/2017 12:11		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		203	pCi/L	+/-26.5	34.8	33.7	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	44800	46400	CPM	96.5	(30%-105%)

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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516036	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J89	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1670715	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 06/11/2017 06:47	Aliquot: 100 mL	Instrument: LSCSILVER
Data File: E1670715R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1670715		
Prep Date: 06/06/2017 12:11		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		176	pCi/L	+/-26.6	33.0	35.1	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	42900	46400	CPM	92.4	(30%-105%)

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: GEL424516	Client: CPRC001	Project: CPRC0117007
Lab Sample ID: 424516037	Date Collected: 06/01/2017 08:30	Matrix: WATER
	Date Received: 06/02/2017 09:10	
Client ID: B39J90	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1670715	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 06/11/2017 07:09	Aliquot: 100 mL	Instrument: LSCSILVER
Data File: E1670715R.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 20 min
Prep Batch: 1670715		
Prep Date: 06/06/2017 12:11		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		205	pCi/L	+/-26.8	35.1	34.1	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	44800	46400	CPM	96.6	(30%-105%)

Comments:

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 23, 2017

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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 424516

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Alpha Spec									
Batch	1670768								
QC1203803280	MB								
Plutonium-238			U	0.0515	pCi/L			HAKB	06/21/1716:22
				Uncert: +/-0.286					
				TPU: +/-0.286					
Plutonium-239/240			U	0.154	pCi/L				
				Uncert: +/-0.407					
				TPU: +/-0.408					
**Plutonium-242 Tracer	19.7			14.9	pCi/L	REC: 76 (30%-105%)			
				Uncert: +/-2.76					
				TPU: +/-4.05					
QC1203803281	424516029	DUP							
Plutonium-238		U	-0.0327	U	-0.0234	pCi/L			06/20/1712:27
				Uncert: +/-0.282	+/-0.202		RPD: 0	N/A	
				TPU: +/-0.283	+/-0.202		RER: 0.0524	(0-2)	
Plutonium-239/240			12.3		11.0	pCi/L			
				Uncert: +/-2.58	+/-2.04		RPD: 11	(0% - 20%)	
				TPU: +/-3.35	+/-2.62		RER: 0.593	(0-2)	
**Plutonium-242 Tracer	19.7		12.3		16.9	pCi/L	REC: 86 (30%-105%)		
				Uncert: +/-3.24	+/-2.72				
				TPU: +/-4.71	+/-4.00				
QC1203803282	LCS								
Plutonium-238			U	0.0928	pCi/L				06/20/1712:27
				Uncert: +/-0.416					
				TPU: +/-0.416					
Plutonium-239/240	19.8			19.8	pCi/L	REC: 100 (80%-120%)			
				Uncert: +/-2.99					
				TPU: +/-4.39					
**Plutonium-242 Tracer	19.7			12.9	pCi/L	REC: 66 (30%-105%)			
				Uncert: +/-2.99					
				TPU: +/-4.37					
Rad Gamma Spec									
Batch	1671427								
QC1203804805	MB								
Iodine-129			U	-0.00946	pCi/L			MJH1	06/08/1715:40
				Uncert: +/-0.208					
				TPU: +/-0.208					
QC1203804806	424692001	DUP							
Iodine-129			0.857		0.939	pCi/L			06/08/1715:40
				Uncert: +/-0.549	+/-0.442		RPD: 9	(0% - 100%)	
				TPU: +/-0.555	+/-0.452		RER: 0.225	(0-2)	
QC1203804807	424692001	MS							
Iodine-129		32.0	0.857		36.5	pCi/L	REC: 111 (75%-125%)		06/08/1716:17
				Uncert: +/-0.549	+/-4.80				
				TPU: +/-0.555	+/-6.26				
QC1203804808	LCS								

QC Summary

Workorder: 424516

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1671427								
Iodine-129	0.026			27.2	pCi/L	REC: 104	(80%-120%)		
	Uncert:			+/-2.81					
	TPU:			+/-3.89					
Batch	1675360								
QC1203814555	MB								
Cesium-137			U	1.64	pCi/L			MXR1	06/22/1707:31
	Uncert:			+/-4.69					
	TPU:			+/-4.75					
Cobalt-60			U	1.89	pCi/L				
	Uncert:			+/-5.64					
	TPU:			+/-5.71					
Europium-152			U	-1.48	pCi/L				
	Uncert:			+/-11.3					
	TPU:			+/-11.4					
Europium-154			U	-0.932	pCi/L				
	Uncert:			+/-12.7					
	TPU:			+/-12.7					
Europium-155			U	-0.472	pCi/L				
	Uncert:			+/-14.7					
	TPU:			+/-14.7					
QC1203814556	424516023	DUP							
Cesium-137		107		117	pCi/L				06/22/1707:31
	Uncert:	+/-15.3		+/-18.7		RPD: 9	(0% - 20%)		
	TPU:	+/-16.1		+/-19.5		RER: 0.776	(0-2)		
Cobalt-60		110		117	pCi/L				
	Uncert:	+/-16.2		+/-19.4		RPD: 7	(0% - 20%)		
	TPU:	+/-16.8		+/-20.0		RER: 0.578	(0-2)		
Europium-152		U -5.64	U	-10.4	pCi/L				
	Uncert:	+/-11.6		+/-13.5		RPD: 0	N/A		
	TPU:	+/-11.8		+/-14.3		RER: 0.507	(0-2)		
Europium-154		U 6.37	U	-3.19	pCi/L				
	Uncert:	+/-11.2		+/-12.1		RPD: 0	N/A		
	TPU:	+/-11.5		+/-12.2		RER: 1.12	(0-2)		
Europium-155		U -5.07	U	-1.14	pCi/L				
	Uncert:	+/-13.5		+/-18.8		RPD: 0	N/A		
	TPU:	+/-13.7		+/-18.8		RER: 0.331	(0-2)		
QC1203814557	LCS								
Americium-241	1.10E+05			1.16E+05	pCi/L	REC: 105	(80%-120%)		06/22/1707:35
	Uncert:			+/-2150					
	TPU:			+/-9420					
Cesium-137	42000			43900	pCi/L	REC: 104	(80%-120%)		
	Uncert:			+/-746					
	TPU:			+/-4200					
Cobalt-60	38000			39300	pCi/L	REC: 103	(80%-120%)		
	Uncert:			+/-822					
	TPU:			+/-3450					
Europium-152			U	-339	pCi/L				
	Uncert:			+/-294					
	TPU:			+/-333					
Europium-154			U	-90.2	pCi/L				

QC Summary

Workorder: 424516

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1675360								
				Uncert:		+/-201			
				TPU:		+/-205			
Europium-155			U	405	pCi/L				
				Uncert:		+/-371			
				TPU:		+/-415			
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%)	

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch		1670989							
		TPU:	+/-2410	+/-3610					
						RER:	1.16 (0-2)		
QC1203803805	LCS								
Alpha	80.6			82.6	pCi/L	REC:	103 (80%-120%)		06/06/1716:27
		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		1670715							
QC1203803131	MB								
Technetium-99			U	16.3	pCi/L			CXS7	06/11/1707:53
		Uncert:		+/-21.0					
		TPU:		+/-21.1					
**Technetium-99m Tracer		46400		42900	CPM	REC:	93 (30%-105%)		
QC1203803132	424396002	DUP							
Technetium-99			U	2.58	U	14.6			06/11/1708:14
		Uncert:	+/-21.2	+/-21.3		RPD:	0 N/A		
		TPU:	+/-21.2	+/-21.4		RER:	0.784 (0-2)		
**Technetium-99m Tracer		46400		42000	CPM	REC:	90 (30%-105%)		
QC1203803133	LCS								
Technetium-99	861			817	pCi/L	REC:	95 (80%-120%)		06/12/1707:30
		Uncert:		+/-47.9					
		TPU:		+/-103					
**Technetium-99m Tracer		46400		44700	CPM	REC:	96 (30%-105%)		
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					

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1674224								
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
- > 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)

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	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.

** 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.