

May 12, 2015



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www.gel.com

May 06, 2015

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

Re: CHPRC SAF S15-004
Work Order: 371055
SDG: GEL371055

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 15, 2015. 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,

Chelsea Seagle
Chelsea Seagle for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: S15-004-095 and S15-004-123
Enclosures



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Case Narrative

May 12, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S15-004
SDG: GEL371055

May 06, 2015

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on April 15, 2015, 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 and DER

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
371055001	B30N96
371055002	B30P24
371055003	B30P26

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.

May 12, 2015

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, Metals and Radiochemistry.

This package, to the best of my knowledge, 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 Manger (or designee) and the laboratory's client services representative as verified by their signatures on this report.

Chelsea Seagle
Chelsea Seagle for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # S15-004-095
Page 1 of 1

371055

Collector: CHRIS FULTON
CHPRC

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

SAF No. S15-004
Purchase Order/Charge Code 300071

Project Title: CERCLA, APRIL 2015
Sampling Origin: Hanford Site

Shipped To (Lab): GEL Laboratories, LLC
Logbook No. HNF-N-506 756
Ice Chest No. GWS-432

Protocol: SURV
Method of Shipment: Commercial Carrier
Bill of Lading/Air Bill No. 7733 6914 5970

Priority: 30 Days
Offsite Property No. 5565

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

SPECIAL INSTRUCTIONS Hold Time: Total Activity Exemption: Yes No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30N96	N	W APR 14 2015	0835	3x1-L GIP	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B30N96	N	W APR 14 2015	↓	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

May 12, 2015

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
CHRIS FULTON CHPRC			APR 14 2015 0950	L.D. Wall CHPRC			APR 14 2015 0950	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				
L.D. Wall CHPRC			APR 14 2015 1400	FEDEX				
Relinquished By				Received By				
				M. Carlson M. Carlson			4-15-15 0855	
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 2/23/2015

A-6004-842 (REV 2)

641102

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# **S15-004-123**
Page 1 of 1

Collector: **CHRIS FULTON CHPRC**
 SAF No.: **S15-004**
 Project Title: **CERCLA, APRIL 2015**
 Shipped To (Lab): **GEL Laboratories, LLC**
 Protocol: **SURV**

Contact/Requester: **Karen Waters-Husted**
 Sampling Origin: **Hanford Site**
 Logbook No.: **HNF-N-506 155**
 Method of Shipment: **Commercial Carrier**
 Priority: **30 Days**

Telephone No.: **509-376-4650**
 Purchase Order/Charge Code: **300071**
 Ice Chest No.: **6209-393**
 Bill of Lading/Air Bill No.: **7733 6232 6904**
 Offsite Property No.: **5542**

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

SPECIAL INSTRUCTIONS
 Hold Time: _____
 Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30P24	N	W	APR 13 2015	1331	1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B30P24	N	W			4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30P24	N	W			1x2-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B30P24	N	W			1x4-L G/P	GAMMA_GS: COMMON	6 Months	HNO3 to pH <2
B30P24	N	W			2x4-L G/P	1129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B30P24	N	W			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B30P24	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None
B30P26	Y	W			1x500-mL G/P	6010_METALS_ICP: GW 04; 6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2

May 12, 2015

Relinquished By CHRIS FULTON CHPRC	Print 	Sign	Date/Time APR 13 2015 1440	Received By SSU-1	Print	Sign	Date/Time APR 13 2015 1440	Matrix *
Relinquished By SSU-1	Print 	Sign	Date/Time APR 14 2015 1400	Received By F.M. HANUHPRC	Print	Sign	Date/Time APR 14 2015 0720	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By F.M. HANUHPRC	Print 	Sign	Date/Time APR 14 2015 1400	Received By FEDEX	Print	Sign	Date/Time APR 14 2015 0720	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By CHRIS FULTON	Print 	Sign	Date/Time APR 14 2015 1400	Received By M. Kraslow	Print	Sign	Date/Time APR 14 2015 0855	

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

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>371055</u>	
Received By: <u>MF</u>		Date Received: <u>4-15-15</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *All temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>180532776</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
8	Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7733 6232 6904 2c</u> <u>7733 6514 5970 2c</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

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

Project Specific Qualifier Definitions for GEL Client Code: **CPRC**

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 06 May 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Volatile Analysis

Case Narrative

May 12, 2015
GC/MS Volatile
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL371055
Work Order #: 371055

Method/Analysis Information

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

Analytical Method: SW846 8260C

Analytical Batch Number: 1472916

Sample Analysis

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

Sample ID	Client ID
371055002	B30P24
1203303705	Method Blank (MB)
1203303706	Laboratory Control Sample (LCS)
1203303707	Laboratory Control Sample (LCS)
1203303708	371055002(B30P24) Post Spike (PS)
1203303709	371055002(B30P24) Post Spike Duplicate (PSD)
1203303718	371055002(B30P24) Post Spike (PS)
1203303719	371055002(B30P24) Post Spike Duplicate (PSD)

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

The data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference

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

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification Requirements

All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 371055002 (B30P24) was designated for spike analysis.

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
1203303708 (B30P24PS)	2-Butanone	60.9* (70%-130%)
	2-Hexanone	67.3* (70%-130%)
	Acetone	42.7* (70%-130%)
1203303709 (B30P24PSD)	2-Butanone	60.2* (70%-130%)
	2-Hexanone	65.6* (70%-130%)
	Acetone	42.8* (70%-130%)

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1406274 was generated for samples 1203303708 (B30P24PS) and 1203303709 (B30P24PSD) in this SDG/batch.

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

May 12, 2015

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: GEL371055 GEL Work Order: 371055

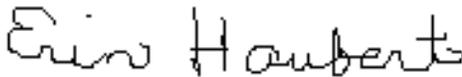
The Qualifiers in this report are defined as follows:

- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 12 MAY 2015

Title: Data Validator

Sample Data Summary

May 12, 2015

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Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL371055	Date Collected: 04/13/2015 13:31	Matrix: WATER
Lab Sample ID: 371055002	Date Received: 04/15/2015 08:55	
	Client: CPRC001	Project: CPRC0S15004
Client ID: B30P24	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Batch ID: 1472916	Inst: VOA4.I	Dilution: 1
Run Date: 04/24/2015 12:06	Analyst: ACJ	Purge Vol: 5 mL
Prep Date: 04/24/2015 12:06		
Data File: 042415V4\4F508.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-34-5	1,1,2,2-Tetrachloroethane	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
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	2.00	5.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	2.00	5.00
106-93-4	1,2-Dibromoethane	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
78-87-5	1,2-Dichloropropane	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
75-25-2	Bromoform	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	J	2.38	ug/L	1.60	5.00	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	2.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	2.00	5.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	2.00	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
107-05-1	Allyl chloride	U	3.00	ug/L	3.00	10.0	10.0
75-00-3	Chloroethane	U	0.300	ug/L	0.300	2.00	10.0
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	2.00	10.0
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	2.00	10.0
97-63-2	Ethyl methacrylate	U	3.00	ug/L	3.00	10.0	10.0
74-88-4	Iodomethane	U	3.00	ug/L	3.00	10.0	10.0
126-98-7	Methacrylonitrile	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

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Volatile
Certificate of Analysis
Sample Summary

SDG Number: GEL371055	Date Collected: 04/13/2015 13:31	Matrix: WATER
Lab Sample ID: 371055002	Date Received: 04/15/2015 08:55	
Client ID: B30P24	Client: CPRC001	Project: CPRC0S15004
Batch ID: 1472916	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 04/24/2015 12:06	Inst: VOA4.I	Dilution: 1
Prep Date: 04/24/2015 12:06	Analyst: ACJ	Purge Vol: 5 mL
Data File: 042415V4\4F508.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
591-78-6	2-Hexanone	TU	3.00	ug/L	3.00	10.0	20.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0
108-05-4	Vinyl acetate	U	1.60	ug/L	1.60	5.00	50.0
110-57-6	trans-1,4-Dichloro-2-butene	U	1.50	ug/L	1.50	10.0	50.0
75-05-8	Acetonitrile	U	16.7	ug/L	16.7	50.0	100
107-02-8	Acrolein	U	3.00	ug/L	3.00	10.0	100
107-13-1	Acrylonitrile	U	3.00	ug/L	3.00	10.0	100
78-83-1	Isobutyl alcohol	U	33.0	ug/L	33.0	100	500

Quality Control Summary

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 371055

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
QC1203303706	LCS										
1,1,1,2-Tetrachloroethane	50.0			43.6	ug/L		87.2	(70%-130%)	ACJ	04/24/15	09:27
1,1,1-Trichloroethane	50.0			42.9	ug/L		85.8	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0			45.2	ug/L		90.5	(70%-130%)			
1,1,2-Trichloroethane	50.0			42.8	ug/L		85.5	(70%-130%)			
1,1-Dichloroethane	50.0			41.2	ug/L		82.4	(70%-130%)			
1,1-Dichloroethylene	50.0			38.5	ug/L		77	(70%-130%)			
1,2,3-Trichloropropane	50.0			45.9	ug/L		91.9	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0			52.6	ug/L		105	(70%-130%)			
1,2-Dibromoethane	50.0			44.5	ug/L		89.1	(70%-130%)			
1,2-Dichloroethane	50.0			41.6	ug/L		83.2	(70%-130%)			
1,2-Dichloropropane	50.0			42.0	ug/L		84	(70%-130%)			
2-Butanone	250			236	ug/L		94.3	(70%-130%)			
2-Hexanone	250			229	ug/L		91.5	(70%-130%)			
4-Methyl-2-pentanone	250			225	ug/L		90.1	(70%-130%)			
Acetone	250			231	ug/L		92.4	(70%-130%)			
Acetonitrile	1250			1130	ug/L		90.3	(70%-130%)			
Benzene	50.0			40.9	ug/L		81.7	(70%-130%)			
Bromoform	50.0			47.7	ug/L		95.3	(70%-130%)			
Carbon disulfide	250			206	ug/L		82.6	(70%-130%)			
Carbon tetrachloride	50.0			40.7	ug/L		81.5	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Chlorobenzene	50.0			42.3	ug/L		84.7	(70%-130%)	ACJ	04/24/15	09:27
Chloroethane	50.0			42.1	ug/L		84.3	(70%-130%)			
Chloroform	50.0			41.4	ug/L		82.8	(70%-130%)			
Dibromochloromethane	50.0			45.2	ug/L		90.3	(70%-130%)			
Dibromomethane	50.0			43.0	ug/L		86.1	(70%-130%)			
Dichlorodifluoromethane	50.0			45.4	ug/L		90.8	(70%-130%)			
Ethylbenzene	50.0			41.8	ug/L		83.6	(70%-130%)			
Iodomethane	250			209	ug/L		83.7	(70%-130%)			
Methylene chloride	50.0			38.2	ug/L		76.4	(70%-130%)			
Styrene	50.0			42.7	ug/L		85.4	(70%-130%)			
Tetrachloroethylene	50.0			41.8	ug/L		83.7	(70%-130%)			
Toluene	50.0			41.2	ug/L		82.3	(70%-130%)			
Trichloroethylene	50.0			41.9	ug/L		83.8	(70%-130%)			
Vinyl acetate	250			232	ug/L		93	(70%-130%)			
Vinyl chloride	50.0			44.2	ug/L		88.4	(70%-130%)			
Xylenes (total)	150			126	ug/L		83.8	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			43.4	ug/L		86.7	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			39.8	ug/L		79.7	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			45.2	ug/L		90.4	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			47.7	ug/L		95.4	(77%-123%)			
**Bromofluorobenzene	50.0			48.3	ug/L		96.6	(80%-120%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
**Toluene-d8	50.0			48.7	ug/L		97.4	(80%-120%)			
QC1203303707	LCS										
2-Chloro-1,3-butadiene	50.0			42.1	ug/L		84.1	(70%-130%)	ACJ	04/24/15	10:41
Acrolein	250			196	ug/L		78.5	(70%-130%)			
Acrylonitrile	250			203	ug/L		81.4	(70%-130%)			
Allyl chloride	250			179	ug/L		71.5	(70%-130%)			
Ethyl methacrylate	250			212	ug/L		84.8	(70%-130%)			
Isobutyl alcohol	2500			2150	ug/L		86	(70%-130%)			
Methacrylonitrile	250			199	ug/L		79.6	(70%-130%)			
trans-1,4-Dichloro-2-butene	250			219	ug/L		87.5	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			48.8	ug/L		97.6	(77%-123%)			
**Bromofluorobenzene	50.0			49.5	ug/L		98.9	(80%-120%)			
**Toluene-d8	50.0			48.7	ug/L		97.4	(80%-120%)			
QC1203303705	MB										
1,1,1,2-Tetrachloroethane			U	0.300	ug/L					04/24/15	11:09
1,1,1-Trichloroethane			U	0.300	ug/L						
1,1,2,2-Tetrachloroethane			U	0.300	ug/L						
1,1,2-Trichloroethane			U	0.300	ug/L						
1,1-Dichloroethane			U	0.300	ug/L						
1,1-Dichloroethylene			U	0.300	ug/L						
1,2,3-Trichloropropane			U	0.300	ug/L						
1,2-Dibromo-3-chloropropane			U	0.500	ug/L						
1,2-Dibromoethane			U	0.300	ug/L						
1,2-Dichloroethane			U	0.300	ug/L						

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
1,2-Dichloropropane			U	0.300	ug/L				ACJ	04/24/15	11:09
2-Butanone			U	3.00	ug/L						
2-Chloro-1,3-butadiene			U	0.300	ug/L						
2-Hexanone			U	3.00	ug/L						
4-Methyl-2-pentanone			U	3.00	ug/L						
Acetone			U	3.00	ug/L						
Acetonitrile			U	16.7	ug/L						
Acrolein			U	3.00	ug/L						
Acrylonitrile			U	3.00	ug/L						
Allyl chloride			U	3.00	ug/L						
Benzene			U	0.300	ug/L						
Bromoform			U	0.300	ug/L						
Carbon disulfide			U	1.60	ug/L						
Carbon tetrachloride			U	0.300	ug/L						
Chlorobenzene			U	0.300	ug/L						
Chloroethane			U	0.300	ug/L						
Chloroform			U	0.300	ug/L						
Dibromochloromethane			U	0.300	ug/L						
Dibromomethane			U	0.300	ug/L						
Dichlorodifluoromethane			U	0.300	ug/L						
Ethyl methacrylate			U	3.00	ug/L						

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Ethylbenzene			U	0.300	ug/L						
Iodomethane			U	3.00	ug/L				ACJ	04/24/15	11:09
Isobutyl alcohol			U	33.0	ug/L						
Methacrylonitrile			U	3.00	ug/L						
Methylene chloride			U	1.60	ug/L						
Styrene			U	0.300	ug/L						
Tetrachloroethylene			U	0.300	ug/L						
Toluene			U	0.300	ug/L						
Trichloroethylene			U	0.300	ug/L						
Vinyl acetate			U	1.60	ug/L						
Vinyl chloride			U	0.300	ug/L						
Xylenes (total)			U	0.300	ug/L						
cis-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,2-Dichloroethylene			U	0.300	ug/L						
trans-1,3-Dichloropropylene			U	0.300	ug/L						
trans-1,4-Dichloro-2-butene			U	1.50	ug/L						
**1,2-Dichloroethane-d4	50.0			50.4	ug/L		101	(77%-123%)			
**Bromofluorobenzene	50.0			56.2	ug/L		112	(80%-120%)			
**Toluene-d8	50.0			48.8	ug/L		97.7	(80%-120%)			
QC1203303708 371055002 PS											
1,1,1,2-Tetrachloroethane	50.0	U	0.00	45.5	ug/L		90.9	(70%-130%)		04/24/15	15:24
1,1,1-Trichloroethane	50.0	U	0.00	44.9	ug/L		89.8	(70%-130%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00	45.3	ug/L		90.6	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
1,1,2-Trichloroethane	50.0	U	0.00		44.3	ug/L	88.6	(70%-130%)	ACJ	04/24/15	15:24
1,1-Dichloroethane	50.0	U	0.00		44.2	ug/L	88.3	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00		41.6	ug/L	83.2	(70%-130%)			
1,2,3-Trichloropropane	50.0	U	0.00		45.3	ug/L	90.6	(70%-130%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00		48.2	ug/L	96.4	(70%-130%)			
1,2-Dibromoethane	50.0	U	0.00		44.9	ug/L	89.9	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00		44.7	ug/L	89.4	(70%-130%)			
1,2-Dichloropropane	50.0	U	0.00		44.9	ug/L	89.7	(70%-130%)			
2-Butanone	250	TU	0.00	T	152	ug/L	60.9*	(70%-130%)			
2-Hexanone	250	TU	0.00	T	168	ug/L	67.3*	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00		215	ug/L	86.2	(70%-130%)			
Acetone	250	TU	0.00	T	107	ug/L	42.7*	(70%-130%)			
Acetonitrile	1250	U	0.00		1110	ug/L	88.6	(70%-130%)			
Benzene	50.0	U	0.00		43.7	ug/L	87.3	(70%-130%)			
Bromoform	50.0	U	0.00		46.4	ug/L	92.7	(70%-130%)			
Carbon disulfide	250	U	0.00		219	ug/L	87.5	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00		43.4	ug/L	86.8	(70%-130%)			
Chlorobenzene	50.0	U	0.00		44.8	ug/L	89.5	(70%-130%)			
Chloroethane	50.0	U	0.00		42.8	ug/L	85.6	(70%-130%)			
Chloroform	50.0	U	0.00		43.9	ug/L	87.8	(70%-130%)			
Dibromochloromethane	50.0	U	0.00		45.5	ug/L	91	(70%-130%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Dibromomethane	50.0	U	0.00	44.4	ug/L		88.8	(70%-130%)			
Dichlorodifluoromethane	50.0	U	0.00	44.6	ug/L		89.1	(70%-130%)	ACJ	04/24/15	15:24
Ethylbenzene	50.0	U	0.00	44.6	ug/L		89.1	(70%-130%)			
Iodomethane	250	U	0.00	219	ug/L		87.5	(70%-130%)			
Methylene chloride	50.0	J	2.38	42.6	ug/L		80.4	(70%-130%)			
Styrene	50.0	U	0.00	45.3	ug/L		90.5	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	43.8	ug/L		87.5	(70%-130%)			
Toluene	50.0	U	0.00	43.8	ug/L		87.7	(70%-130%)			
Trichloroethylene	50.0	U	0.00	44.2	ug/L		88.4	(70%-130%)			
Vinyl acetate	250	U	0.00	236	ug/L		94.3	(70%-130%)			
Vinyl chloride	50.0	U	0.00	44.6	ug/L		89.2	(70%-130%)			
Xylenes (total)	150	U	0.00	134	ug/L		89.1	(70%-130%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	44.9	ug/L		89.7	(70%-130%)			
trans-1,2-Dichloroethylene	50.0	U	0.00	42.7	ug/L		85.4	(70%-130%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	46.4	ug/L		92.9	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		50.4	49.2	ug/L		98.3	(77%-123%)			
**Bromofluorobenzene	50.0		53.4	49.0	ug/L		98	(80%-120%)			
**Toluene-d8	50.0		48.7	49.8	ug/L		99.7	(80%-120%)			
QC1203303718 371055002 PS											
2-Chloro-1,3-butadiene	50.0	U	0.00	46.4	ug/L		92.7	(70%-130%)		04/24/15	16:20
Acrolein	250	U	0.00	196	ug/L		78.4	(70%-130%)			
Acrylonitrile	250	U	0.00	210	ug/L		84	(70%-130%)			
Allyl chloride	250	U	0.00	202	ug/L		80.9	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Ethyl methacrylate	250	U	0.00	221	ug/L		88.2	(70%-130%)	ACJ	04/24/15	16:20
Isobutyl alcohol	2500	U	0.00	2230	ug/L		89.4	(70%-130%)			
Methacrylonitrile	250	U	0.00	213	ug/L		85	(70%-130%)			
trans-1,4-Dichloro-2-butene	250	U	0.00	221	ug/L		88.5	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		50.4	50.2	ug/L		100	(77%-123%)			
**Bromofluorobenzene	50.0		53.4	51.4	ug/L		103	(80%-120%)			
**Toluene-d8	50.0		48.7	50.5	ug/L		101	(80%-120%)			
QC1203303709 371055002 PSD											
1,1,1,2-Tetrachloroethane	50.0	U	0.00	45.4	ug/L	0.066	90.9	(0%-20%)		04/24/15	15:52
1,1,1-Trichloroethane	50.0	U	0.00	45.2	ug/L	0.511	90.3	(0%-20%)			
1,1,2,2-Tetrachloroethane	50.0	U	0.00	44.6	ug/L	1.53	89.2	(0%-20%)			
1,1,2-Trichloroethane	50.0	U	0.00	44.0	ug/L	0.657	88	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	44.1	ug/L	0.136	88.2	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	41.1	ug/L	1.21	82.2	(0%-20%)			
1,2,3-Trichloropropane	50.0	U	0.00	44.9	ug/L	1.02	89.7	(0%-20%)			
1,2-Dibromo-3-chloropropane	50.0	U	0.00	48.8	ug/L	1.22	97.6	(0%-20%)			
1,2-Dibromoethane	50.0	U	0.00	45.2	ug/L	0.488	90.3	(0%-20%)			
1,2-Dichloroethane	50.0	U	0.00	44.5	ug/L	0.359	89	(0%-20%)			
1,2-Dichloropropane	50.0	U	0.00	45.2	ug/L	0.666	90.3	(0%-20%)			
2-Butanone	250	TU	0.00	T	151	ug/L	1.07	60.2*		(0%-20%)	
2-Hexanone	250	TU	0.00	T	164	ug/L	2.47	65.6*		(0%-20%)	
4-Methyl-2-pentanone	250	U	0.00	212	ug/L	1.55	84.8	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Acetone	250	TU	0.00	T	107	ug/L	0.112	42.8*	(0%-20%)	ACJ	04/24/15 15:52
Acetonitrile	1250	U	0.00		1100	ug/L	0.870	87.8	(0%-20%)		
Benzene	50.0	U	0.00		43.5	ug/L	0.459	86.9	(0%-20%)		
Bromoform	50.0	U	0.00		46.5	ug/L	0.409	93.1	(0%-20%)		
Carbon disulfide	250	U	0.00		219	ug/L	0.0549	87.5	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		43.3	ug/L	0.185	86.6	(0%-20%)		
Chlorobenzene	50.0	U	0.00		44.5	ug/L	0.650	89	(0%-20%)		
Chloroethane	50.0	U	0.00		44.2	ug/L	3.29	88.4	(0%-20%)		
Chloroform	50.0	U	0.00		44.1	ug/L	0.500	88.3	(0%-20%)		
Dibromochloromethane	50.0	U	0.00		45.3	ug/L	0.463	90.6	(0%-20%)		
Dibromomethane	50.0	U	0.00		44.7	ug/L	0.673	89.4	(0%-20%)		
Dichlorodifluoromethane	50.0	U	0.00		46.6	ug/L	4.48	93.2	(0%-20%)		
Ethylbenzene	50.0	U	0.00		44.3	ug/L	0.721	88.5	(0%-20%)		
Iodomethane	250	U	0.00		222	ug/L	1.61	89	(0%-20%)		
Methylene chloride	50.0	J	2.38		42.8	ug/L	0.422	80.7	(0%-20%)		
Styrene	50.0	U	0.00		45.5	ug/L	0.463	90.9	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		43.2	ug/L	1.33	86.4	(0%-20%)		
Toluene	50.0	U	0.00		43.3	ug/L	1.15	86.7	(0%-20%)		
Trichloroethylene	50.0	U	0.00		44.4	ug/L	0.406	88.8	(0%-20%)		
Vinyl acetate	250	U	0.00		235	ug/L	0.314	94	(0%-20%)		
Vinyl chloride	50.0	U	0.00		47.2	ug/L	5.67	94.4	(0%-20%)		

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QC Summary

Workorder: 371055

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1472916										
Xylenes (total)	150	U	0.00	133	ug/L	0.713	88.5	(0%-20%)			
cis-1,3-Dichloropropylene	50.0	U	0.00	45.2	ug/L	0.667	90.3	(0%-20%)	ACJ	04/24/15	15:52
trans-1,2-Dichloroethylene	50.0	U	0.00	42.7	ug/L	0.0468	85.4	(0%-20%)			
trans-1,3-Dichloropropylene	50.0	U	0.00	46.0	ug/L	1.02	91.9	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		50.4	52.4	ug/L		105	(77%-123%)			
**Bromofluorobenzene	50.0		53.4	48.9	ug/L		97.8	(80%-120%)			
**Toluene-d8	50.0		48.7	49.6	ug/L		99.2	(80%-120%)			
QC1203303719 371055002 PSD											
2-Chloro-1,3-butadiene	50.0	U	0.00	46.2	ug/L	0.454	92.3	(0%-20%)		04/24/15	16:49
Acrolein	250	U	0.00	203	ug/L	3.60	81.3	(0%-20%)			
Acrylonitrile	250	U	0.00	215	ug/L	2.48	86.1	(0%-20%)			
Allyl chloride	250	U	0.00	202	ug/L	0.089	80.9	(0%-20%)			
Ethyl methacrylate	250	U	0.00	223	ug/L	1.28	89.4	(0%-20%)			
Isobutyl alcohol	2500	U	0.00	2340	ug/L	4.59	93.6	(0%-20%)			
Methacrylonitrile	250	U	0.00	219	ug/L	2.82	87.5	(0%-20%)			
trans-1,4-Dichloro-2-butene	250	U	0.00	226	ug/L	2.19	90.5	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		50.4	50.6	ug/L		101	(77%-123%)			
**Bromofluorobenzene	50.0		53.4	50.7	ug/L		101	(80%-120%)			
**Toluene-d8	50.0		48.7	49.6	ug/L		99.1	(80%-120%)			

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis

May 12, 2015

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QC Summary

Workorder: 371055

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

May 12, 2015

Surrogate Recovery Report

SDG Number: GEL371055

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203303706	LCS for batch 1472916	95	97	97
1203303707	LCS for batch 1472916	98	97	99
1203303705	MB for batch 1472916	101	98	112
371055002	B30P24	101	97	107
1203303708	B30P24PS	98	100	98
1203303709	B30P24PSD	105	99	98
1203303718	B30P24PS	100	101	103
1203303719	B30P24PSD	101	99	101

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(77%-123%)

(80%-120%)

(80%-120%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 01-MAY-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VOA GC/MS	Test / Method: SW846 8260C	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1472916	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 371031(GEL371031),371055(GEL371055),371059(GEL371059),371147(GEL371147),371148(GEL371148),371575(GEL371575),371578(GEL371578)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/MSD, or PS/PSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203303708PS,1203303709PSD</p>		<p>1. 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.</p> <p>1203303708 (B30P24PS) 2-Butanone [60.9* (70%-130%)], 2-Hexanone [67.3* (70%-130%)], Acetone [42.7* (70%-130%)].</p> <p>1203303709 (B30P24PSD) 2-Butanone [60.2* (70%-130%)], 2-Hexanone [65.6* (70%-130%)] and Acetone [42.8* (70%-130%)].</p>	

Originator's Name:
Crystal Stacey 01-MAY-15

Data Validator/Group Leader:
Erin Haubert 12-MAY-15

Metals Analysis

Case Narrative

May 12, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL371055

Work Order #: 371055

Sample ID	Client ID
371055002	B30P24
371055003	B30P26
1203299913	Method Blank (MB)ICP
1203299914	Laboratory Control Sample (LCS)
1203299917	371055002(B30P24L) Serial Dilution (SD)
1203299915	371055002(B30P24S) Matrix Spike (MS)
1203299916	371055002(B30P24SD) Matrix Spike Duplicate (MSD)
1203299864	Method Blank (MB)ICP-MS
1203299865	Laboratory Control Sample (LCS)
1203299868	371055002(B30P24L) Serial Dilution (SD)
1203299866	371055002(B30P24S) Matrix Spike (MS)
1203299867	371055002(B30P24SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1471460 and 1471447
Prep Batch :	1471459 and 1471446
Standard Operating Procedures:	GL-MA-E-013 REV# 23, GL-MA-E-006 REV# 12 and GL-MA-E-014 REV# 26
Analytical Method:	SW846 3005A/6010C and SW846 3005A/6020A
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium,

tantalum, and/or lutetium were utilized to cover the mass spectrum.

Calibration Information

Instrument Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. ICP.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blanks (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 371055002 (B30P24)-ICP and ICP-MS.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and prepared according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

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.

May 12, 2015

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL371055 GEL Work Order: 371055

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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: Patricia Steele

Date: 12 MAY 2015

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL371055

METHOD TYPE: SW846

SAMPLE ID: 371055002

CLIENT ID: B30P24

CONTRACT: CPRC0S15004

MATRIX: WATER

DATE RECEIVED 15-APR-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7429-90-5	Aluminum	15	ug/L	U		MS	15	1	ICPMS12	150423-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	150423-2
7440-38-2	Arsenic	4.22	ug/L	B		MS	1.7	1	ICPMS12	150423-2
7440-39-3	Barium	17.4	ug/L			MS	0.6	1	ICPMS12	150423-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	150423-2
7440-42-8	Boron	21.1	ug/L			MS	4	1	ICPMS12	150424-7
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	150423-2
7440-70-2	Calcium	21600	ug/L			P	50	1	OPTIMA3	042815A-1
7440-47-3	Chromium	2	ug/L	U		MS	2	1	ICPMS12	150423-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	150423-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	150423-2
7439-89-6	Iron	854	ug/L			P	30	1	OPTIMA3	042815A-1
7439-92-1	Lead	1.52	ug/L	B		MS	0.5	1	ICPMS12	150423-2
7439-95-4	Magnesium	7110	ug/L			P	110	1	OPTIMA3	042815A-1
7439-96-5	Manganese	40.9	ug/L			MS	1	1	ICPMS12	150423-2
7439-98-7	Molybdenum	8.6	ug/L			MS	0.165	1	ICPMS12	150423-2
7440-02-0	Nickel	0.631	ug/L	B		MS	0.5	1	ICPMS12	150423-2
7440-09-7	Potassium	5120	ug/L			P	50	1	OPTIMA3	042815A-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	150423-2
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS12	150423-2
7440-23-5	Sodium	23700	ug/L			P	100	1	OPTIMA3	042815A-1
7440-24-6	Strontium	150	ug/L			MS	2	1	ICPMS12	150423-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	150423-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	150423-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	150423-2
7440-61-1	Uranium	1.19	ug/L			MS	0.067	1	ICPMS12	150423-6

METALS
 -1-
 INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL371055

METHOD TYPE: SW846

SAMPLE ID: 371055002

CLIENT ID: B30P24

CONTRACT: CPRCOS15004

MATRIX: WATER

DATE RECEIVED 15-APR-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-62-2	Vanadium	11.8	ug/L			P	1	1	OPTIMA3	042815A-1
7440-66-6	Zinc	15.8	ug/L			MS	3.5	1	ICPMS12	150423-2

*Analytical Methods:

P SW846 3005A/6010C
 MS SW846 3005A/6020A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL371055

METHOD TYPE: SW846

SAMPLE ID: 371055003

CLIENT ID: B30P26

CONTRACT: CPRC0S15004

MATRIX: WATER

DATE RECEIVED 15-APR-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7429-90-5	Aluminum	15	ug/L	U		MS	15	1	ICPMS12	150423-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	150423-2
7440-38-2	Arsenic	4.4	ug/L	B		MS	1.7	1	ICPMS12	150423-2
7440-39-3	Barium	16.8	ug/L			MS	0.6	1	ICPMS12	150423-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	150423-2
7440-42-8	Boron	21	ug/L			MS	4	1	ICPMS12	150424-7
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	150423-2
7440-70-2	Calcium	22300	ug/L			P	50	1	OPTIMA3	042815A-1
7440-47-3	Chromium	2	ug/L	U		MS	2	1	ICPMS12	150423-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	150423-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	150423-2
7439-89-6	Iron	556	ug/L			P	30	1	OPTIMA3	042815A-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	150423-2
7439-95-4	Magnesium	7290	ug/L			P	110	1	OPTIMA3	042815A-1
7439-96-5	Manganese	31.2	ug/L			MS	1	1	ICPMS12	150423-2
7439-98-7	Molybdenum	8.82	ug/L			MS	0.165	1	ICPMS12	150423-2
7440-02-0	Nickel	0.5	ug/L	U		MS	0.5	1	ICPMS12	150423-2
7440-09-7	Potassium	5200	ug/L			P	50	1	OPTIMA3	042815A-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	150423-2
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS12	150423-2
7440-23-5	Sodium	23900	ug/L			P	100	1	OPTIMA3	042815A-1
7440-24-6	Strontium	149	ug/L			MS	2	1	ICPMS12	150423-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	150423-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	150423-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	150423-2
7440-61-1	Uranium	1.19	ug/L			MS	0.067	1	ICPMS12	150423-6

METALS
 -1-
 INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL371055

METHOD TYPE: SW846

SAMPLE ID: 371055003

CLIENT ID: B30P26

CONTRACT: CPRCOS15004

MATRIX: WATER

DATE RECEIVED 15-APR-15

LEVEL: Low

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-62-2	Vanadium	12.4	ug/L			P	1	1	OPTIMA3	042815A-1
7440-66-6	Zinc	3.96	ug/L	B		MS	3.5	1	ICPMS12	150423-2

*Analytical Methods:

P SW846 3005A/6010C
 MS SW846 3005A/6020A

Quality Control Summary

May 12, 2015

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QC Summary

Report Date: May 12, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 371055

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
QC1203299865	LCS										
Aluminum	2000			2030	ug/L		101	(80%-120%)	BAJ	04/23/15	18:03
Antimony	50.0			49.4	ug/L		98.8	(80%-120%)			
Arsenic	50.0			50.2	ug/L		100	(80%-120%)			
Barium	50.0			48.9	ug/L		97.7	(80%-120%)			
Beryllium	50.0			57.7	ug/L		115	(80%-120%)			
Boron	100			106	ug/L		106	(80%-120%)		04/24/15	16:25
Cadmium	50.0			50.9	ug/L		102	(80%-120%)		04/23/15	18:03
Chromium	50.0			49.9	ug/L		99.8	(80%-120%)			
Cobalt	50.0			49.5	ug/L		98.9	(80%-120%)			
Copper	50.0			50.7	ug/L		101	(80%-120%)			
Lead	50.0			49.9	ug/L		99.9	(80%-120%)			
Manganese	50.0			50.3	ug/L		101	(80%-120%)			
Molybdenum	50.0			49.7	ug/L		99.5	(80%-120%)			
Nickel	50.0			50.9	ug/L		102	(80%-120%)			
Selenium	50.0			49.9	ug/L		99.8	(80%-120%)			
Silver	50.0			50.8	ug/L		102	(80%-120%)			
Strontium	50.0			49.9	ug/L		99.7	(80%-120%)			
Thallium	50.0			48.7	ug/L		97.3	(80%-120%)			
Thorium	50.0			49.7	ug/L		99.4	(80%-120%)			
Tin	50.0			50.5	ug/L		101	(80%-120%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
Uranium	50.0			51.4	ug/L		103	(80%-120%)	BAJ	04/24/15	09:09
Zinc	50.0			53.3	ug/L		107	(80%-120%)		04/23/15	18:03
QC1203299864	MB										
Aluminum			U	ND	ug/L					04/23/15	17:59
Antimony			U	ND	ug/L						
Arsenic			U	ND	ug/L						
Barium			U	ND	ug/L						
Beryllium			U	ND	ug/L						
Boron			U	ND	ug/L					04/24/15	16:23
Cadmium			U	ND	ug/L					04/23/15	17:59
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Lead			U	ND	ug/L						
Manganese			U	ND	ug/L						
Molybdenum			U	ND	ug/L						
Nickel			U	ND	ug/L						
Selenium			U	ND	ug/L						
Silver			U	ND	ug/L						
Strontium			U	ND	ug/L						
Thallium			U	ND	ug/L						
Thorium			U	ND	ug/L						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
Tin			U	ND	ug/L				BAJ	04/23/15	17:59
Uranium			U	ND	ug/L					04/24/15	09:08
Zinc			U	ND	ug/L					04/23/15	17:59
QC1203299866 371055002 MS											
Aluminum	2000	U	ND	2010	ug/L		100	(75%-125%)		04/23/15	18:09
Antimony	50.0	U	ND	50.0	ug/L		99.5	(75%-125%)			
Arsenic	50.0	B	4.22	54.5	ug/L		100	(75%-125%)			
Barium	50.0		17.4	66.8	ug/L		98.9	(75%-125%)			
Beryllium	50.0	U	ND	59.1	ug/L		118	(75%-125%)			
Boron	100		21.1	130	ug/L		109	(75%-125%)		04/24/15	16:28
Cadmium	50.0	U	ND	51.1	ug/L		102	(75%-125%)		04/23/15	18:09
Chromium	50.0	U	ND	51.4	ug/L		99.3	(75%-125%)			
Cobalt	50.0	U	ND	49.4	ug/L		98.7	(75%-125%)			
Copper	50.0	U	ND	49.5	ug/L		98.3	(75%-125%)			
Lead	50.0	B	1.52	50.2	ug/L		97.3	(75%-125%)			
Manganese	50.0		40.9	91.0	ug/L		100	(75%-125%)			
Molybdenum	50.0		8.60	59.4	ug/L		102	(75%-125%)			
Nickel	50.0	B	0.631	50.2	ug/L		99.2	(75%-125%)			
Selenium	50.0	U	ND	50.4	ug/L		98.8	(75%-125%)			
Silver	50.0	U	ND	49.8	ug/L		99.7	(75%-125%)			
Strontium	50.0		150	202	ug/L		103	(75%-125%)			
Thallium	50.0	U	ND	48.1	ug/L		96.2	(75%-125%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
Thorium	50.0	U	ND	49.7	ug/L		99.4	(75%-125%)	BAJ	04/23/15	18:09
Tin	50.0	U	ND	50.8	ug/L		101	(75%-125%)			
Uranium	50.0		1.19	52.9	ug/L		103	(75%-125%)		04/24/15	09:12
Zinc	50.0		15.8	58.8	ug/L		86	(75%-125%)		04/23/15	18:09
QC1203299867 371055002 MSD											
Aluminum	2000	U	ND	2040	ug/L	1.67	102	(0%-20%)		04/23/15	18:12
Antimony	50.0	U	ND	50.1	ug/L	0.182	99.7	(0%-20%)			
Arsenic	50.0	B	4.22	55.5	ug/L	1.82	102	(0%-20%)			
Barium	50.0		17.4	67.2	ug/L	0.470	99.5	(0%-20%)			
Beryllium	50.0	U	ND	59.0	ug/L	0.240	118	(0%-20%)			
Boron	100		21.1	129	ug/L	0.767	108	(0%-20%)		04/24/15	16:30
Cadmium	50.0	U	ND	50.4	ug/L	1.46	101	(0%-20%)		04/23/15	18:12
Chromium	50.0	U	ND	51.5	ug/L	0.107	99.5	(0%-20%)			
Cobalt	50.0	U	ND	49.4	ug/L	0.0101	98.7	(0%-20%)			
Copper	50.0	U	ND	49.2	ug/L	0.486	97.8	(0%-20%)			
Lead	50.0	B	1.52	50.4	ug/L	0.394	97.7	(0%-20%)			
Manganese	50.0		40.9	91.3	ug/L	0.270	101	(0%-20%)			
Molybdenum	50.0		8.60	60.3	ug/L	1.35	103	(0%-20%)			
Nickel	50.0	B	0.631	50.1	ug/L	0.157	99	(0%-20%)			
Selenium	50.0	U	ND	51.0	ug/L	1.25	100	(0%-20%)			
Silver	50.0	U	ND	50.3	ug/L	1.02	101	(0%-20%)			
Strontium	50.0		150	202	ug/L	0.259	104	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
Thallium	50.0	U	ND	47.9	ug/L	0.462	95.8	(0%-20%)	BAJ	04/23/15	18:12
Thorium	50.0	U	ND	50.1	ug/L	0.664	100	(0%-20%)			
Tin	50.0	U	ND	51.0	ug/L	0.450	102	(0%-20%)			
Uranium	50.0		1.19	53.3	ug/L	0.902	104	(0%-20%)		04/24/15	09:13
Zinc	50.0		15.8	59.9	ug/L	1.86	88.2	(0%-20%)		04/23/15	18:12
QC1203299868 371055002 SDILT											
Aluminum		U	ND DU	ND	ug/L	N/A		(0%-10%)		04/23/15	18:19
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Arsenic		B	4.22 DU	ND	ug/L	N/A		(0%-10%)			
Barium			17.4 D	3.66	ug/L	5.28		(0%-10%)			
Beryllium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Boron			21.1 D	6.25	ug/L	47.9		(0%-10%)		04/24/15	16:33
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)		04/23/15	18:19
Chromium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Copper		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Lead		B	1.52 DU	ND	ug/L	N/A		(0%-10%)			
Manganese			40.9 D	8.48	ug/L	3.57		(0%-10%)			
Molybdenum			8.60 D	1.70	ug/L	1.29		(0%-10%)			
Nickel		B	0.631 DU	ND	ug/L	N/A		(0%-10%)			
Selenium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Silver		U	ND DU	ND	ug/L	N/A		(0%-10%)			

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1471447										
Strontium		150	D	29.3	ug/L	2.59		(0%-10%)	BAJ	04/23/15	18:19
Thallium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Thorium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Tin	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium		1.19	D	0.233	ug/L	1.69		(0%-10%)		04/24/15	09:16
Zinc		15.8	D	4.62	ug/L	46.3		(0%-10%)		04/23/15	18:19
Metals Analysis-ICP											
Batch	1471460										
QC1203299914	LCS										
Calcium	5000			5000	ug/L		100	(80%-120%)	HSC	04/28/15	17:05
Iron	5000			5230	ug/L		105	(80%-120%)			
Magnesium	5000			5130	ug/L		103	(80%-120%)			
Potassium	5000			5090	ug/L		102	(80%-120%)			
Sodium	5000			5800	ug/L		116	(80%-120%)			
Vanadium	500			515	ug/L		103	(80%-120%)			
QC1203299913	MB										
Calcium			U	ND	ug/L					04/28/15	17:02
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Potassium			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
QC1203299915	371055002 MS										
Calcium	5000	21600		26500	ug/L		N/A	(75%-125%)		04/28/15	17:14

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1471460										
Iron	5000	854		6170	ug/L		106	(75%-125%)			
Magnesium	5000	7110		12200	ug/L		101	(75%-125%)	HSC	04/28/15	17:14
Potassium	5000	5120		10100	ug/L		100	(75%-125%)			
Sodium	5000	23700		29500	ug/L		N/A	(75%-125%)			
Vanadium	500	11.8		524	ug/L		102	(75%-125%)			
QC1203299916 371055002 MSD											
Calcium	5000	21600		26700	ug/L	0.447	N/A	(0%-20%)		04/28/15	17:18
Iron	5000	854		6050	ug/L	1.99	104	(0%-20%)			
Magnesium	5000	7110		12300	ug/L	1.35	104	(0%-20%)			
Potassium	5000	5120		10200	ug/L	0.797	102	(0%-20%)			
Sodium	5000	23700		29500	ug/L	0.197	N/A	(0%-20%)			
Vanadium	500	11.8		525	ug/L	0.0991	103	(0%-20%)			
QC1203299917 371055002 SDILT											
Calcium		21600	D	4340	ug/L	.447		(0%-10%)		04/28/15	17:21
Iron		854	D	169	ug/L	1.01		(0%-10%)			
Magnesium		7110	D	1430	ug/L	.754		(0%-10%)			
Potassium		5120	D	1050	ug/L	2.38		(0%-10%)			
Sodium		23700	D	4690	ug/L	.961		(0%-10%)			
Vanadium		11.8	D	2.22	ug/L	6.07		(0%-10%)			

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

Radiological Analysis

May 12, 2015
Radiochemistry
Technical Case Narrative
CH2M Hill Plateau Remediation Company (CPRC)
SDG #: GEL371055
Work Order #: 371055

Method/Analysis Information

Product: GAMMA_GS:COMMON (Cs137,Co60,Eu152,Eu154,Eu155)
Analytical Method: EPA 901.1
Analytical Batch Number: 1471486

Sample ID	Client ID
371055002	B30P24
1203299984	Method Blank (MB)
1203299986	Laboratory Control Sample (LCS)
1203299985	371055002(B30P24) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371055002 (B30P24).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: I129LL_SEP_LEPS_GS_LL: COMMON
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Batch Number: 1475057

Sample ID	Client ID
371055002	B30P24
1203309109	Method Blank (MB)
1203309112	Laboratory Control Sample (LCS)
1203309110	371738001(B30NP8) Sample Duplicate (DUP)
1203309111	371738001(B30NP8) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-006 REV# 21.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371738001 (B30NP8).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

May 12, 2015

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1472564

Sample ID	Client ID
371055002	B30P24
1203302707	Method Blank (MB)
1203302711	Laboratory Control Sample (LCS)
1203302708	371055002(B30P24) Sample Duplicate (DUP)
1203302709	371055002(B30P24) Matrix Spike (MS)
1203302710	371055002(B30P24) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 18.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371055002 (B30P24).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

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 1203302709 (B30P24MS) was recounted due to low recovery. The recount is reported. Sample 1203302710 (B30P24MSD) was recounted due to high recovery. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike and matrix spike duplicate, 1203302709 (B30P24MS) and 1203302710 (B30P24MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1474261

Sample ID	Client ID
371055001	B30N96
371055002	B30P24
1203307170	Method Blank (MB)
1203307172	Laboratory Control Sample (LCS)
1203307171	371823008(B30P61) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371823008 (B30P61).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and duplicate, 1203307171 (B30P61DUP), do not meet the client relative error ratio requirement; however, both sample and duplicate results are less than the minimum detectable activity.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Sample 371055001 (B30N96) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 1474359

Sample ID	Client ID
371055001	B30N96
371055002	B30P24
1203307467	Method Blank (MB)
1203307470	Laboratory Control Sample (LCS)
1203307468	371241001(B30PK8) Sample Duplicate (DUP)
1203307469	371241001(B30PK8) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

Designated QC

The following sample was used for QC: 371241001 (B30PK8).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The Matrix Spike 1203307469 (Non SDG 371241001MS) did not meet recovery requirements due to the sample activity being greater than five times the spiked nominal concentration.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Samples 371055001 (B30N96) and 371055002 (B30P24) were recounted to verify sample results. The recount results are similar to the original results. Original results are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

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.

May 12, 2015

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: GEL371055 GEL Work Order: 371055

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kate Gellatly

Date: 12 MAY 2015

Title: Analyst I

Sample Data Summary

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055001	Date Collected: 04/14/2015 08:35	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30N96	Method: EPA 905.0 Modified	Prep Basis: As Received
Batch ID: 1474261	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 05/11/2015 17:36	Aliquot: 0.3 L	Instrument: PIC11B
Data File: S1474261r.xls	Prep Method: EPA 905.0 Modified	Count Time: 60 min
Prep Batch: 1474261		
Prep Date: 05/07/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Total Strontium	U	0.0582	pCi/L	+/-0.555	0.555	1.03	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.80	8.10	mg	96.3	(25%-125%)

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).

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055001	Date Collected: 04/14/2015 08:35	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30N96	Method: EPA 906.0 Modified	Prep Basis: As Received
Batch ID: 1474359	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 05/07/2015 00:49	Aliquot: 50 mL	Instrument: LSCORANGE
Data File: T1474359.xls	Prep Method: EPA 906.0 Modified	Count Time: 120.0296 min
Prep Batch: 1474359		
Prep Date: 05/04/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		658	pCi/L	+/-77.4	149	81.4	100

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

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

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055002	Date Collected: 04/13/2015 13:31	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30P24	Method: EPA 900.0/SW846 9310	Prep Basis: As Received
Batch ID: 1472564	Analyst: KXB2	SOP Ref: GL-RAD-A-001
Run Date: 04/21/2015 19:40	Aliquot: 0.15 L	Instrument: PIC9C
Data File: AB1472564r1.xls	Prep Method: EPA 900.0/SW846 9310	Count Time: 500 min
Prep Batch: 1472564		
Prep Date: 04/20/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha ALPHA	U	0.633	pCi/L	+/-0.849	0.858	1.43	3.00
12587-47-2	Beta BETA		9.66	pCi/L	+/-0.990	1.86	1.19	4.00

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

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055002	Date Collected: 04/13/2015 13:31	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30P24	Method: EPA 905.0 Modified	Prep Basis: As Received
Batch ID: 1474261	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 05/10/2015 10:30	Aliquot: 0.3 L	Instrument: PIC1D
Data File: S1474261r.xls	Prep Method: EPA 905.0 Modified	Count Time: 60 min
Prep Batch: 1474261		
Prep Date: 05/07/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Total Strontium	U	-0.881	pCi/L	+/-0.610	0.610	1.34	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	7.90	8.10	mg	97.5	(25%-125%)

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).

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055
 Lab Sample ID: 371055002

 Client ID: B30P24
 Batch ID: 1471486
 Run Date: 04/17/2015 07:18
 Data File: G371055002.CNF;1
 Prep Batch: 1471486
 Prep Date: 04/16/2015 00:00

Client: CPRC001
 Date Collected: 04/13/2015 13:31
 Date Received: 04/15/2015 08:55

 Method: EPA 901.1
 Analyst: MJH1
 Aliquot: 2 L
 Prep Method: EPA 901.1

Project: CPRC0S15004
 Matrix: WATER

 Prep Basis: As Received
 SOP Ref: GL-RAD-A-013
 Instrument: GAM44
 Count Time: 120 min

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10045-97-3	Cesium-137	U	-2.95	pCi/L	+/-3.23	3.50	5.41	10.0
10198-40-0	Cobalt-60	U	-1.7	pCi/L	+/-2.77	2.87	4.84	
14683-23-9	Europium-152	U	9.98	pCi/L	+/-9.16	10.3	18.3	
15585-10-1	Europium-154	U	1.04	pCi/L	+/-8.78	8.79	17.7	
14391-16-3	Europium-155	U	-2.64	pCi/L	+/-12.2	12.2	21.2	

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).

May 12, 2015

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055002	Date Collected: 04/13/2015 13:31	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30P24	Method: DOE EML HASL-300,I-01 Mo	Prep Basis: As Received
Batch ID: 1475057	Analyst: BSW1	SOP Ref: GL-RAD-A-006
Run Date: 05/04/2015 09:50	Aliquot: 1.6 L	Instrument: XRAY1
Data File: I371055002.CNF;1	Prep Method: DOE EML HASL-300,I-01 M	Count Time: 60 min
Prep Batch: 1475057		
Prep Date: 05/01/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129		3.98	pCi/L	+/-0.953	1.03	0.711	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. TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

May 12, 2015
Rad

**Certificate of Analysis
Sample Summary**

SDG Number: GEL371055	Client: CPRC001	Project: CPRC0S15004
Lab Sample ID: 371055002	Date Collected: 04/13/2015 13:31	Matrix: WATER
	Date Received: 04/15/2015 08:55	
Client ID: B30P24	Method: EPA 906.0 Modified	Prep Basis: As Received
Batch ID: 1474359	Analyst: GXR1	SOP Ref: GL-RAD-A-002
Run Date: 05/07/2015 04:07	Aliquot: 50 mL	Instrument: LSCORANGE
Data File: T1474359.xls	Prep Method: EPA 906.0 Modified	Count Time: 120.0297 min
Prep Batch: 1474359		
Prep Date: 05/04/2015 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		7680	pCi/L	+/-218	1500	81.4	100

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Quality Control Data

GEL LABORATORIES LLC

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

QC Summary

Report Date: May 12, 2015
Page 1 of 4

Client : CH2MHill Plateau Remediation Company
 MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Workorder: 371055

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1471486								
QC1203299984	MB								
Cesium-137			U	-0.0952	pCi/L			MJH1	04/17/1507:22
				Uncert: +/-2.52					
				TPU: +/-2.52					
Cobalt-60			U	0.516	pCi/L				
				Uncert: +/-2.01					
				TPU: +/-2.03					
Europium-152			U	4.75	pCi/L				
				Uncert: +/-7.94					
				TPU: +/-8.24					
Europium-154			U	-0.254	pCi/L				
				Uncert: +/-6.33					
				TPU: +/-6.33					
Europium-155			U	2.07	pCi/L				
				Uncert: +/-7.99					
				TPU: +/-8.05					
QC1203299985	371055002	DUP							
Cesium-137		U	-2.95	U	-1.52	pCi/L			04/17/1509:31
			Uncert: +/-3.23		+/-4.09		RPD: 0	N/A	
			TPU: +/-3.50		+/-4.14		RER: 0.516	(0-2)	
Cobalt-60		U	-1.7	U	0.00472	pCi/L			
			Uncert: +/-2.77		+/-4.15		RPD: 0	N/A	
			TPU: +/-2.87		+/-4.15		RER: 0.662	(0-2)	
Europium-152		U	9.98	U	5.11	pCi/L			
			Uncert: +/-9.16		+/-11.5		RPD: 0	N/A	
			TPU: +/-10.3		+/-11.7		RER: 0.613	(0-2)	
Europium-154		U	1.04	U	-7.31	pCi/L			
			Uncert: +/-8.78		+/-9.87		RPD: 0	N/A	
			TPU: +/-8.79		+/-10.4		RER: 1.20	(0-2)	
Europium-155		U	-2.64	U	-1.62	pCi/L			
			Uncert: +/-12.2		+/-12.9		RPD: 0	N/A	
			TPU: +/-12.2		+/-12.9		RER: 0.112	(0-2)	
QC1203299986	LCS								
Americium-241	34400				37200	pCi/L	REC: 108	(80%-120%)	04/17/1507:22
					Uncert: +/-2200				
					TPU: +/-3620				
Cesium-137	13800				14300	pCi/L	REC: 103	(80%-120%)	
					Uncert: +/-367				
					TPU: +/-1260				
Cobalt-60	15800				16200	pCi/L	REC: 103	(80%-120%)	
					Uncert: +/-413				
					TPU: +/-1360				
Europium-152			U		-121	pCi/L			
					Uncert: +/-264				
					TPU: +/-270				

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QC Summary

Workorder: 371055

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1471486								
Europium-154			U	4.10	pCi/L				
	Uncert:			+/-142					
	TPU:			+/-142					
Europium-155			U	120	pCi/L				
	Uncert:			+/-371					
	TPU:			+/-375					
Batch	1475057								
QC1203309109	MB								
Iodine-129			U	-0.126	pCi/L			BSW1	05/05/1506:35
	Uncert:			+/-0.203					
	TPU:			+/-0.211					
QC1203309110	371738001	DUP							
Iodine-129				4.32	4.05	pCi/L			05/05/1507:16
	Uncert:	+/-1.03		+/-1.21		RPD: 6	(0% - 20%)		
	TPU:	+/-1.12		+/-1.28		RER: 0.308	(0-2)		
QC1203309111	371738001	MS							
Iodine-129	26.0		4.32	24.0	pCi/L	REC: 76	(75%-125%)		05/05/1507:32
	Uncert:	+/-1.03		+/-2.08					
	TPU:	+/-1.12		+/-3.18					
QC1203309112	LCS								
Iodine-129	26.0			22.3	pCi/L	REC: 86	(80%-120%)		05/05/1507:41
	Uncert:			+/-2.30					
	TPU:			+/-3.20					
Rad Gas Flow									
Batch	1472564								
QC1203302707	MB								
Alpha			U	-1.35	pCi/L			KXB2	04/21/1518:08
	Uncert:			+/-0.976					
	TPU:			+/-0.976					
Beta			U	-0.396	pCi/L				
	Uncert:			+/-1.42					
	TPU:			+/-1.42					
QC1203302708	371055002	DUP							
Alpha		U	0.633	U	0.746	pCi/L			04/21/1519:40
	Uncert:	+/-0.849		+/-0.949		RPD: 0	N/A		
	TPU:	+/-0.858		+/-0.960		RER: 0.171	(0-2)		
Beta			9.66	10.6	pCi/L				
	Uncert:	+/-0.990		+/-1.04		RPD: 10	(0% - 20%)		
	TPU:	+/-1.86		+/-2.09		RER: 0.687	(0-2)		
QC1203302709	371055002	MS							
Alpha	486	U	0.633	575	pCi/L	REC: 118	(75%-125%)		04/22/1513:28
	Uncert:	+/-0.849		+/-55.1					
	TPU:	+/-0.858		+/-109					
Beta	1890		9.66	2140	pCi/L	REC: 113	(75%-125%)		
	Uncert:	+/-0.990		+/-74.6					
	TPU:	+/-1.86		+/-357					
QC1203302710	371055002	MSD							
Alpha	486	U	0.633	511	pCi/L	REC: 105	(75%-125%)		
	Uncert:	+/-0.849		+/-51.8		RPD: 12	(0%-20%)		
	TPU:	+/-0.858		+/-100		RER: 0.842	(0-2)		

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QC Summary

Workorder: 371055

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1472564								
Beta	1890	9.66		2090	pCi/L	REC: 110	(75%-125%)		
	Uncert:	+/-0.990		+/-74.3		RPD: 2	(0%-20%)		
	TPU:	+/-1.86		+/-350		RER: 0.175	(0-2)		
QC1203302711	LCS								
Alpha	81.1			95.4	pCi/L	REC: 118	(80%-120%)		04/21/1517:59
	Uncert:			+/-8.85					
	TPU:			+/-18.4					
Beta	315			374	pCi/L	REC: 119	(80%-120%)		
	Uncert:			+/-13.0					
	TPU:			+/-62.4					
Batch	1474261								
QC1203307170	MB								
Total Strontium			U	-0.707	pCi/L			KSD1	05/10/1510:29
	Uncert:			+/-0.506					
	TPU:			+/-0.506					
**Strontium Carrier	8.10			7.40	mg	REC: 91	(25%-125%)		
QC1203307171	371823008	DUP							
Total Strontium		U	0.555	U	-0.358	pCi/L			05/10/1510:29
	Uncert:		+/-0.530		+/-0.427		RPD: 0	N/A	
	TPU:		+/-0.545		+/-0.427		RER: 2.58	(0-2)	
**Strontium Carrier	8.10			7.80	mg	REC: 96	(25%-125%)		
QC1203307172	LCS								
Total Strontium	78.6			76.4	pCi/L	REC: 97	(80%-120%)		05/10/1510:29
	Uncert:			+/-3.57					
	TPU:			+/-17.9					
**Strontium Carrier	8.10			7.90	mg	REC: 98	(25%-125%)		
Rad Liquid Scintillation									
Batch	1474359								
QC1203307467	MB								
Tritium			U	28.8	pCi/L			GXR1	05/07/1519:08
	Uncert:			+/-47.3					
	TPU:			+/-47.7					
QC1203307468	371241001	DUP							
Tritium				6.85E+05	6.86E+05	pCi/L			05/07/1521:11
	Uncert:			+/-13200	+/-13200		RPD: 0	(0% - 20%)	
	TPU:			+/-1.33E+05	+/-1.33E+05		RER: 0.00951	(0-2)	
QC1203307469	371241001	MS							
Tritium	1850			6.85E+05	7.08E+05	pCi/L	REC: N/A		05/07/1521:34
	Uncert:			+/-13200	+/-13700				
	TPU:			+/-1.33E+05	+/-1.38E+05				
QC1203307470	LCS								
Tritium	1840				1720	pCi/L	REC: 94	(80%-120%)	05/07/1521:16
	Uncert:				+/-302				
	TPU:				+/-450				

Notes:

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

The Qualifiers in this report are defined as follows:

QC Summary

Workorder: 371055

Page 4 of 4

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

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

** Indicates analyte is a surrogate compound.

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

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

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