

7/28/2016



July 26, 2016

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

Re: CHPRC SAF S16-006
Work Order: 400517
SDG: GEL400517

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 01, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: S16-006-231, S16-006-235, S16-006-254 and S16-006-260
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	7
Data Review Qualifier Definitions.....	13
Laboratory Certifications.....	15
FID Diesel Range Organics Analysis.....	17
Case Narrative.....	18
Sample Data Summary.....	21
Quality Control Summary.....	23
Metals Analysis.....	27
Case Narrative.....	28
Sample Data Summary.....	32
Quality Control Summary.....	42
General Chem Analysis.....	51
Case Narrative.....	52
Sample Data Summary.....	55
Quality Control Summary.....	59
Radiological Analysis.....	62
Case Narrative.....	63
Sample Data Summary.....	68
Quality Control Summary.....	74

Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF S16-006
SDG: GEL400517**

July 26, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on July 01, 2016, 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>
400517001	B359P0
400517002	B359T5
400517003	B359T2
400517004	B35BH8
400517005	B35BH5
400517006	B35BX0
400517007	B35BX2

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Diesel Range Organics, General Chemistry, Metals and Radiochemistry.

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


Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400517
Work Order #: 400517

Diesel Range Organics

Analysis of Diesel Range Organics by Flame Ionization Detector

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

Calibration Information

Continuing Calibration Verification (CCV) Requirements

The associated calibration verification standards (ICV or CCV) did not meet the acceptance criteria with positive bias. This non-compliance had no adverse effects on the data as the target analytes were not detected above the PQL in the associated environmental samples.

Miscellaneous Information

Manual Integrations

Samples 1203578384 (LCS), 1203578385 (B35BX0MS) and 1203578386 (B35BX0MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

Metals

Determination of Metals by ICP

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

Calibration Information

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D 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. 400517002 (B359T5), 400517003 (B359T2), 400517006 (B35BX0) and 400517007 (B35BX2).

Determination of Metals by ICP-MS

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

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of selenium and thorium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203578171 (MB).

General Chemistry

Alkalinity

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

Radiochemistry

9310_ALPHABETA_GPC: COMMON

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

Quality Control (QC) Information

QC Information

The sample and the duplicate, 1203579110 (B35BW1DUP), did not meet the client alpha relative error ratio requirement; However, both results are less than the MDA.

Technical Information

Gross Alpha/Beta Preparation Information

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

Recounts

Sample 1203579113 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203579111 (B35BW1MS) and 1203579112 (B35BW1MSD),

aliquots were reduced to conserve sample volume.

SRISO_SEP_PRECIP_GPC: COMMON

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

Technical Information

Recounts

Samples 1203580406 (B35BH5DUP), 400517005 (B35BH5) and 400517006 (B35BX0) were verified by recounting at least five days from the separation date. The recounts are reported.

TC99_EIE_LSC: COMMON

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

TRITIUM_DIST_LSC: COMMON

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

Certification Statement

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

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **S16-006-254**
Page 1 of 1

400517

Collector: Karen Campbell CHPRC
 Contact/Requester: Karen Waters-Husted
 Telephone No. 509-376-4650
 SAF No. S16-006
 Sampling Origin: Hanford Site
 Purchase Order/Charge Code: 300071
 Project Title: SURV, JUNE 2016
 Logbook No. HNF-N-506 86/39
 Ice Chest No. 6205-498
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No. 776650613192
 Protocol: SURV
 Priority: 30 Days
 Priority: **PRIORITY**
 Offsite Property No. 6788

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: N/A
 Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35BH8	Y	W	6-30-16	0755	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B35BH5	N	W	/	/	1x500-mL G/P	6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B35BH5	N	W	/	/	3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35BH5	N	W	/	/	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35BH5	N	W	6-30-16	0755	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By Karen Campbell CHPRC	Print 	Sign	Date/Time JUN 30 2016 1016	Received By Chris Fulton CHPRC	Print 	Sign	Date/Time JUN 30 2016 1016	Matrix *
Relinquished By Chris Fulton CHPRC	Print 	Sign	Date/Time JUN 30 2016 1900	Received By FEDEX	Print FEDEX	Sign	Date/Time JUN 30 2016 1900	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Print 	Sign	Date/Time 7-1-16 0955	Received By M. Kinslow	Print 	Sign	Date/Time 7-1-16 0955	
Relinquished By	Print 	Sign	Date/Time	Received By	Print	Sign	Date/Time	

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

Disposed By

Date/Time

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

S16-006-235

Page 1 of 1

400517

Collector: Karen Campbell /CHPRC
 Telephone No. 509-376-4650
 Contact/Requester: Karen Waters-Husted
 Purchase Order/Charge Code: 300071
 SAF No. S16-006
 Sampling Origin: Hanford Site
 Project Title: SURV, JUNE 2016
 Logbook No. HNF-N-506 86/39
 Ice Chest No. GWS-498
 Shipped To (Lab): GEL Laboratories, LLC
 Method of Shipment: Commercial Carrier
 Bill of Lading/Air Bill No. 776650013192
 Protocol: SURV
 Priority: 30 Days
 Priority: **PRIORITY**
 Offsite Property No. 6788
 Total Activity Exemption: Yes No

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B359T5	Y	W	6-30-16	1135	1x250-mL GIP	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B359T5	Y	W			1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B359T2	N	W	6-30-16	1135	1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

Relinquished By: Karen Campbell /CHPRC	Print: Karen Campbell	Sign:	Date/Time: JUN 30 2016 12:15	Received By: Frank Hill /CHPRC	Print: Frank Hill	Sign:	Date/Time: JUN 30 2016 2:15
Relinquished By: Frank Hill /CHPRC	Print: Frank Hill	Sign:	Date/Time: JUN 30 2016 4:00	Received By: FEDEX	Print: FEDEX	Sign:	Date/Time: JUN 30 2016
Relinquished By:	Print:	Sign:	Date/Time: JUN 30 2016	Received By: M. Kaslow	Print: M. Kaslow	Sign:	Date/Time: JUN 30 2016 08:55
Relinquished By:	Print:	Sign:	Date/Time: JUN 30 2016	Received By:	Print:	Sign:	Date/Time: JUN 30 2016

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By:
 Date/Time:
 Matrix *
 S = Soil DS = Drum Solids
 SE = Sediment DL = Drum Liquids
 SO = Solid T = Tissue
 SL = Sludge WI = Wipe
 W = Water L = Liquid
 O = Oil V = Vegetation
 A = Air X = Other

CH2M Hill Plateau Remediation Company		C.O.C. # S16-006-231	
40057		Page 1 of 1	
Collector Karen Campbell CHPRC	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	
SAF No. S16-006	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071	
Project Title SURV, JUNE 2016	Logbook No. HNF-N-506 26.139	Ice Chest No. 665-498	
Shipped To (Lab) GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 776650613192	
Protocol SURV	Priority: 30 Days	Offsite Property No. 6788	
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 N/A Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No. B359P0	Filter Y	No/Type Container 1x250-mL GIP	Sample Analysis 2320_ALKALINITY: GW 01
Date 6-30-16	Time 1118	Holding Time 14 Days	Preservative Cool <=6C

Relinquished By Karen Campbell CHPRC	Print <i>Karen Campbell</i>	Sign <i>Karen Campbell</i>	Received By Frank Hill CHPRC	Print <i>Frank Hill</i>	Sign <i>Frank Hill</i>	Date/Time JUN 30 2016	Date/Time JUN 30 2016	Matrix *
Relinquished By Frank Hill CHPRC	Print <i>Frank Hill</i>	Sign <i>Frank Hill</i>	Received By FEDEX	Print <i>FEDEX</i>	Sign <i>FEDEX</i>	Date/Time JUN 30 2016	Date/Time JUN 30 2016	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By <i>FR</i>	Print <i>FR</i>	Sign <i>FR</i>	Received By <i>M Kuslow ml f...</i>	Print <i>M Kuslow ml f...</i>	Sign <i>M Kuslow ml f...</i>	Date/Time 7-1-16 0855	Date/Time 7-1-16 0855	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Received By			Date/Time	Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		

85169

CH2MHill Plateau Remediation Company C.O.C.# **S16-006-260**
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

400517

Collector: Dave Floyd CHPRC **Telephone No.:** 509-376-4650
SAF No.: S16-006 **Purchase Order/Charge Code:** 300071
Project Title: SURV, JUNE 2016 **Ice Chest No.:** GWS-498
Shipped To (Lab): GEL Laboratories, LLC **Bill of Lading/Air Bill No.:** 1776050613192
Protocol: SURV **Priority:** 30 Days **Priority:** **PRIORITY**
Method of Shipment: Commercial Carrier **Offsite Property No.:** 6788

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

Sample No.	Filter *	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35BX0	N	6-30-16	1101	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B35BX0	N			2x1-L P	9310_ALPHABETA_GPC: COMMON	6 Months	HNO3 to pH <2
B35BX0	N			3x1-L G/P	SRISO_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B35BX0	N			3x1-L aG	WTPH_DIESEL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B35BX2	Y			1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

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

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Dave Floyd CHPRC	[Signature]	[Signature]	JUN 30 2016 1220	Frank Hill CHPRC	[Signature]	[Signature]	JUN 30 2016 1220
Frank Hill CHPRC	[Signature]	[Signature]	JUN 30 2016 1400	FEDEX	[Signature]	[Signature]	JUN 30 2016 1400
		[Signature]	JUN 30 2016			[Signature]	JUN 30 2016
		[Signature]				[Signature]	

Matrix *	S	SE	SO	SL	W	O	A	Soil	Sediment	Solid	Sludge	Water	Oil	Air	Drum Solids	Drum Liquids	Tissue	Wipe	Liquid	Vegetation	Other

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

SAMPLE RECEIPT & REVIEW FORM

Client: <u>OPRC</u>		SDG/AR/COC/Work Order:	
Received By: <u>MIC</u>		Date Received: <u>7-1-16</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?			
Classified Radioactive II or III by RSO?			
COC/Samples marked containing PCBs?			
Package, COC, and/or Samples marked as beryllium or asbestos containing?			
Shipped as a DOT Hazardous?			
Samples identified as Foreign Soil?			
		*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
		Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>620</u>	
		If yes, Were swipes taken of sample containers < action levels?	
		If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
		Hazard Class Shipped: UN#:	

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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: Ice bags 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 checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>15046296L</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
9 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
13 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
15 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
16 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7766 5061 3192</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials DS Date 7/1/16 Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Laboratory Certifications

List of current GEL Certifications as of 26 July 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

FID Diesel Range Organics Analysis

Case Narrative

**Diesel Range Organics
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL400517
 Work Order #: 400517**

Product: Analysis of Diesel Range Organics by Flame Ionization Detector

Analytical Method: NWTPH-Dx

Analytical Procedure: GL-OA-E-003 REV# 26

Analytical Batch: 1578956

Preparation Method: SW846 3535A

Preparation Procedure: GL-OA-E-013 REV# 29

Preparation Batch: 1578955

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517006	B35BX0
1203578383	Method Blank (MB)
1203578384	Laboratory Control Sample (LCS)
1203578385	400517006(B35BX0) Matrix Spike (MS)
1203578386	400517006(B35BX0) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Calibration Information

Continuing Calibration Verification (CCV) Requirements

The associated calibration verification standards (ICV or CCV) did not meet the acceptance criteria with positive bias. This non-compliance had no adverse effects on the data as the target analytes were not detected above the PQL in the associated environmental samples.

Miscellaneous Information

Manual Integrations

Samples 1203578384 (LCS), 1203578385 (B35BX0MS) and 1203578386 (B35BX0MSD) required manual integration to correctly position the baseline as set in the calibration standard injections.

Certification Statement

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

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400517 GEL Work Order: 400517

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

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.

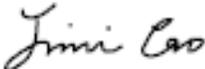
RA Indicates that sample is re-analyzed without re-extraction.

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: Jimin Cao

Date: 15 JUL 2016

Title: Data Validator

Sample Data Summary

FID Diesel Range Organics
 Certificate of Analysis
 Sample Summary

SDG Number: GEL400517	Date Collected: 06/30/2016 11:01	Matrix: WATER
Lab Sample ID: 400517006	Date Received: 07/01/2016 08:55	
	Client: CPRC001	Project: CPRC0S16006
Client ID: B35BX0	Method: NWTPH-Dx	SOP Ref: GL-OA-E-003
Batch ID: 1578956	Inst: FID7.I	Dilution: 1
Run Date: 07/06/2016 04:27	Analyst: LXA1	Inj. Vol: 1 uL
Prep Date: 07/05/2016 08:25	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: 070516DRO-MO\7g0523.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
68334-30-5	Diesel Range Organics	U	50.0	ug/L	50.0	200

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 14, 2016

Page 1 of 2

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1578956										
QC1203578384	LCS										
Diesel Range Organics	2000			1660	ug/L		83	(70%-130%)	LXA1	07/06/16	03:09
**o-Terphenyl	20.0			16.7	ug/L		83	(60%-140%)			
QC1203578383	MB										
Diesel Range Organics			U	50.0	ug/L					07/06/16	02:31
**o-Terphenyl	20.0			13.7	ug/L		69	(60%-140%)			
QC1203578385	400517006 MS										
Diesel Range Organics	2000	U	50.0	1610	ug/L		80	(70%-130%)		07/06/16	05:05
**o-Terphenyl	20.0		12.6	13.9	ug/L		69	(60%-140%)			
QC1203578386	400517006 MSD										
Diesel Range Organics	2000	U	50.0	1730	ug/L	7	87	(0%-20%)		07/06/16	05:44
**o-Terphenyl	20.0		12.6	15.6	ug/L		78	(60%-140%)			

Notes:

The Qualifiers in this report are defined as follows:

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

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QC Summary

Workorder: 400517

Page 2 of 2

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

FID Diesel Range Organics
Surrogate Recovery Report

SDG Number: GEL400517

Matrix Type: LIQUID

Sample ID	Client ID	OTP %REC
1203578383	MB for batch 1578955	69
1203578384	LCS for batch 1578955	83
400517006	B35BX0	63
1203578385	B35BX0MS	69
1203578386	B35BX0MSD	78

Surrogate

OTP = o-Terphenyl

Acceptance Limits

(60%-140%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400517
Work Order #: 400517

Product: Determination of Metals by ICP**Analytical Method:** 6010_METALS_ICP**Analytical Procedure:** GL-MA-E-013 REV# 26**Analytical Batch:** 1578866**Product: Determination of Metals by ICP-MS****Analytical Method:** 6020_METALS_ICPMS**Analytical Procedure:** GL-MA-E-014 REV# 28**Analytical Batch:** 1578873**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 13**Preparation Batches:** 1578865 and 1578872

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517002	B359T5
400517003	B359T2
400517005	B35BH5
400517006	B35BX0
400517007	B35BX2
1203578161	Method Blank (MB)ICP
1203578162	Laboratory Control Sample (LCS)
1203578165	400517002(B359T5L) Serial Dilution (SD)
1203578163	400517002(B359T5S) Matrix Spike (MS)
1203578164	400517002(B359T5SD) Matrix Spike Duplicate (MSD)
1203578171	Method Blank (MB)ICP-MS
1203578172	Laboratory Control Sample (LCS)
1203578175	400517002(B359T5L) Serial Dilution (SD)
1203578173	400517002(B359T5S) Matrix Spike (MS)
1203578174	400517002(B359T5SD) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Calibration Information**CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D 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. 400517002 (B359T5), 400517003 (B359T2), 400517006 (B35BX0) and 400517007 (B35BX2)-ICP.

Quality Control (QC) Information

Method Blank (MB) Statement

The method blanks (MB) analyzed with this SDG met the exception criteria with the exception of selenium and thorium. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203578171 (MB)-ICP-MS.

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.

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400517 GEL Work Order: 400517

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

C Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.

D Results are reported from a diluted aliquot of sample.

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: Jamie Johnson

Date: 28 JUL 2016

Title: Group Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400517

CONTRACT: CPRC0S16006

METHOD TYPE: SW846

SAMPLE ID: 400517002

BASIS: As Received

DATE COLLECTED 30-JUN-16

CLIENT ID: B359T5

LEVEL: Low

DATE RECEIVED 01-JUL-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	15	ug/L	U	15	50	50	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	SKJ	07/22/16 15:16	160722-7	1578873
7440-38-2	Arsenic	1.7	ug/L	U	1.7	5	5	1	MS	SKJ	07/22/16 13:42	160722-6	1578873
7440-39-3	Barium	28.1	ug/L		0.6	2	2	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	07/08/16 15:43	070816-1	1578866
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-70-2	Calcium	19500	ug/L		50	200	200	1	P	HSC	07/08/16 15:43	070816-1	1578866
7440-47-3	Chromium	2	ug/L	U	2	10	10	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-48-4	Cobalt	0.10	ug/L	U	0.1	1	1	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-50-8	Copper	10.5	ug/L		0.35	1	1	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/08/16 15:43	070816-1	1578866
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7439-95-4	Magnesium	4470	ug/L		110	300	300	1	P	HSC	07/08/16 15:43	070816-1	1578866
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7439-98-7	Molybdenum	0.699	ug/L		0.165	0.5	0.5	1	MS	SKJ	07/21/16 14:53	160721-3	1578873
7440-02-0	Nickel	0.709	ug/L	B	0.5	2	2	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-09-7	Potassium	5580	ug/L		50	150	150	1	P	HSC	07/08/16 15:43	070816-1	1578866
7782-49-2	Selenium	4.15	ug/L	CB	1.5	5	5	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-23-5	Sodium	3310	ug/L		100	300	300	1	P	HSC	07/08/16 15:43	070816-1	1578866
7440-24-6	Strontium	111	ug/L		2	10	10	1	MS	SKJ	07/21/16 14:53	160721-3	1578873
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-29-1	Thorium	0.969	ug/L	CB	0.383	2	2	1	MS	SKJ	07/21/16 17:04	160721-5	1578873
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-61-1	Uranium	0.418	ug/L		0.067	0.2	0.2	1	MS	SKJ	07/20/16 22:48	160720-2	1578873
7440-62-2	Vanadium	3.6	ug/L	B	1	5	5	1	P	HSC	07/08/16 15:43	070816-1	1578866
7440-66-6	Zinc	5.85	ug/L	B	3.5	10	10	1	MS	SKJ	07/20/16 22:48	160720-2	1578873

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578866	1578865	SW846 3005A	50	mL	50	mL	07/01/16	JP1
1578873	1578872	SW846 3005A	50	mL	50	mL	07/01/16	JP1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400517

CONTRACT: CPRC0S16006

METHOD TYPE: SW846

SAMPLE ID: 400517003

BASIS: As Received

DATE COLLECTED 30-JUN-16

CLIENT ID: B359T2

LEVEL: Low

DATE RECEIVED 01-JUL-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	15	ug/L	U	15	50	50	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	SKJ	07/22/16 15:23	160722-7	1578873
7440-38-2	Arsenic	1.7	ug/L	U	1.7	5	5	1	MS	SKJ	07/22/16 13:52	160722-6	1578873
7440-39-3	Barium	28	ug/L		0.6	2	2	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	07/08/16 15:32	070816-1	1578866
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-70-2	Calcium	19100	ug/L		50	200	200	1	P	HSC	07/08/16 15:32	070816-1	1578866
7440-47-3	Chromium	2	ug/L	U	2	10	10	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-48-4	Cobalt	0.10	ug/L	U	0.1	1	1	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-50-8	Copper	12.9	ug/L		0.35	1	1	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/08/16 15:32	070816-1	1578866
7439-92-1	Lead	0.558	ug/L	B	0.5	2	2	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7439-95-4	Magnesium	4350	ug/L		110	300	300	1	P	HSC	07/08/16 15:32	070816-1	1578866
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7439-98-7	Molybdenum	0.623	ug/L		0.165	0.5	0.5	1	MS	SKJ	07/21/16 15:10	160721-3	1578873
7440-02-0	Nickel	0.890	ug/L	B	0.5	2	2	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-09-7	Potassium	5420	ug/L		50	150	150	1	P	HSC	07/08/16 15:32	070816-1	1578866
7782-49-2	Selenium	3.83	ug/L	CB	1.5	5	5	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-23-5	Sodium	3070	ug/L		100	300	300	1	P	HSC	07/08/16 15:32	070816-1	1578866
7440-24-6	Strontium	113	ug/L		2	10	10	1	MS	SKJ	07/21/16 15:10	160721-3	1578873
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-29-1	Thorium	0.535	ug/L	CB	0.383	2	2	1	MS	SKJ	07/21/16 17:19	160721-5	1578873
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-61-1	Uranium	0.418	ug/L		0.067	0.2	0.2	1	MS	SKJ	07/20/16 23:16	160720-2	1578873
7440-62-2	Vanadium	3.65	ug/L	B	1	5	5	1	P	HSC	07/08/16 15:32	070816-1	1578866
7440-66-6	Zinc	9.12	ug/L	B	3.5	10	10	1	MS	SKJ	07/20/16 23:16	160720-2	1578873

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578866	1578865	SW846 3005A	50	mL	50	mL	07/01/16	JP1
1578873	1578872	SW846 3005A	50	mL	50	mL	07/01/16	JP1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400517

CONTRACT: CPRC0S16006

METHOD TYPE: SW846

SAMPLE ID:400517005

BASIS: As Received

DATE COLLECTED 30-JUN-16

CLIENT ID: B35BH5

LEVEL: Low

DATE RECEIVED 01-JUL-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-61-1	Uranium	0.599	ug/L		0.067	0.2	15	1	MS	SKJ	07/20/16 23:19	160720-2	1578873

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578873	1578872	SW846 3005A	50	mL	50	mL	07/01/16	JP1

***Analytical Methods:**

MS SW846 3005A/6020A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400517

CONTRACT: CPRC0S16006

METHOD TYPE: SW846

SAMPLE ID: 400517006

BASIS: As Received

DATE COLLECTED 30-JUN-16

CLIENT ID: B35BX0

LEVEL: Low

DATE RECEIVED 01-JUL-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	112	ug/L		15	50	50	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-36-0	Antimony	1.31	ug/L	B	1	3	3	1	MS	SKJ	07/22/16 15:26	160722-7	1578873
7440-38-2	Arsenic	19.5	ug/L		1.7	5	5	1	MS	SKJ	07/22/16 13:57	160722-6	1578873
7440-39-3	Barium	10.5	ug/L		0.6	2	2	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	07/08/16 15:35	070816-1	1578866
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-70-2	Calcium	8130	ug/L		50	200	200	1	P	HSC	07/08/16 15:35	070816-1	1578866
7440-47-3	Chromium	9.4	ug/L	B	2	10	10	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-48-4	Cobalt	0.106	ug/L	B	0.1	1	1	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-50-8	Copper	1.25	ug/L		0.35	1	1	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7439-89-6	Iron	47.5	ug/L	B	30	100	100	1	P	HSC	07/08/16 15:35	070816-1	1578866
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7439-95-4	Magnesium	2060	ug/L		110	300	300	1	P	HSC	07/08/16 15:35	070816-1	1578866
7439-96-5	Manganese	36.6	ug/L		1	5	5	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7439-98-7	Molybdenum	2.91	ug/L		0.165	0.5	0.5	1	MS	SKJ	07/21/16 15:15	160721-3	1578873
7440-02-0	Nickel	0.797	ug/L	B	0.5	2	2	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-09-7	Potassium	1440	ug/L		50	150	150	1	P	HSC	07/08/16 15:35	070816-1	1578866
7782-49-2	Selenium	4.78	ug/L	CB	1.5	5	5	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-23-5	Sodium	75900	ug/L		100	300	300	1	P	HSC	07/08/16 15:35	070816-1	1578866
7440-24-6	Strontium	48.8	ug/L		2	10	10	1	MS	SKJ	07/21/16 15:15	160721-3	1578873
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-29-1	Thorium	0.383	ug/L	U	0.383	2	2	1	MS	SKJ	07/21/16 17:23	160721-5	1578873
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	SKJ	07/20/16 23:23	160720-2	1578873
7440-62-2	Vanadium	21.9	ug/L		1	5	5	1	P	HSC	07/08/16 15:35	070816-1	1578866
7440-66-6	Zinc	3.5	ug/L	U	3.5	10	10	1	MS	SKJ	07/20/16 23:23	160720-2	1578873

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578866	1578865	SW846 3005A	50	mL	50	mL	07/01/16	JP1
1578873	1578872	SW846 3005A	50	mL	50	mL	07/01/16	JP1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL400517

CONTRACT: CPRC0S16006

METHOD TYPE: SW846

SAMPLE ID:400517007

BASIS: As Received

DATE COLLECTED 30-JUN-16

CLIENT ID: B35BX2

LEVEL: Low

DATE RECEIVED 01-JUL-16

MATRIX: WATER

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68.4	ug/L		15	50	50	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-36-0	Antimony	1.46	ug/L	B	1	3	3	1	MS	SKJ	07/22/16 15:27	160722-7	1578873
7440-38-2	Arsenic	19.7	ug/L		1.7	5	5	1	MS	SKJ	07/22/16 14:00	160722-6	1578873
7440-39-3	Barium	8.74	ug/L		0.6	2	2	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-41-7	Beryllium	0.20	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	07/08/16 15:39	070816-1	1578866
7440-43-9	Cadmium	0.110	ug/L	U	0.11	1	1	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-70-2	Calcium	8430	ug/L		50	200	200	1	P	HSC	07/08/16 15:39	070816-1	1578866
7440-47-3	Chromium	9.99	ug/L	B	2	10	10	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-48-4	Cobalt	0.187	ug/L	B	0.1	1	1	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-50-8	Copper	1.07	ug/L		0.35	1	1	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	07/08/16 15:39	070816-1	1578866
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7439-95-4	Magnesium	2120	ug/L		110	300	300	1	P	HSC	07/08/16 15:39	070816-1	1578866
7439-96-5	Manganese	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7439-98-7	Molybdenum	2.98	ug/L		0.165	0.5	0.5	1	MS	SKJ	07/21/16 15:17	160721-3	1578873
7440-02-0	Nickel	0.634	ug/L	B	0.5	2	2	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-09-7	Potassium	1460	ug/L		50	150	150	1	P	HSC	07/08/16 15:39	070816-1	1578866
7782-49-2	Selenium	5.1	ug/L	C	1.5	5	5	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-22-4	Silver	0.20	ug/L	U	0.2	1	1	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-23-5	Sodium	83800	ug/L		100	300	300	1	P	HSC	07/08/16 15:39	070816-1	1578866
7440-24-6	Strontium	49.7	ug/L		2	10	10	1	MS	SKJ	07/21/16 15:17	160721-3	1578873
7440-28-0	Thallium	0.450	ug/L	U	0.45	2	2	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-29-1	Thorium	0.383	ug/L	U	0.383	2	2	1	MS	SKJ	07/21/16 17:25	160721-5	1578873
7440-31-5	Tin	1	ug/L	U	1	5	5	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-61-1	Uranium	0.067	ug/L	U	0.067	0.2	0.2	1	MS	SKJ	07/20/16 23:27	160720-2	1578873
7440-62-2	Vanadium	22.4	ug/L		1	5	5	1	P	HSC	07/08/16 15:39	070816-1	1578866
7440-66-6	Zinc	3.5	ug/L	U	3.5	10	10	1	MS	SKJ	07/20/16 23:27	160720-2	1578873

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1578866	1578865	SW846 3005A	50	mL	50	mL	07/01/16	JP1
1578873	1578872	SW846 3005A	50	mL	50	mL	07/01/16	JP1

***Analytical Methods:**

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 28, 2016

Page 1 of 8

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
QC1203578172	LCS										
Aluminum	2000			1990	ug/L		99.7	(80%-120%)	SKJ	07/20/16	22:44
Antimony	50.0			56.5	ug/L		113	(80%-120%)		07/22/16	15:15
Arsenic	50.0			50.5	ug/L		101	(80%-120%)		07/22/16	13:40
Barium	50.0			48.2	ug/L		96.3	(80%-120%)		07/20/16	22:44
Beryllium	50.0			55.7	ug/L		111	(80%-120%)			
Cadmium	50.0			50.9	ug/L		102	(80%-120%)			
Chromium	50.0			49.3	ug/L		98.6	(80%-120%)			
Cobalt	50.0			49.5	ug/L		98.9	(80%-120%)			
Copper	50.0			50.1	ug/L		100	(80%-120%)			
Lead	50.0			52.6	ug/L		105	(80%-120%)			
Manganese	50.0			49.9	ug/L		99.8	(80%-120%)			
Molybdenum	50.0			49.4	ug/L		98.8	(80%-120%)		07/21/16	14:50
Nickel	50.0			49.6	ug/L		99.2	(80%-120%)		07/20/16	22:44
Selenium	50.0			53.7	ug/L		107	(80%-120%)			
Silver	50.0			51.2	ug/L		102	(80%-120%)			
Strontium	50.0			52.0	ug/L		104	(80%-120%)		07/21/16	14:50
Thallium	50.0			50.4	ug/L		101	(80%-120%)		07/20/16	22:44
Thorium	50.0			51.1	ug/L		102	(80%-120%)		07/21/16	17:02
Tin	50.0			50.9	ug/L		102	(80%-120%)		07/20/16	22:44
Uranium	50.0			52.9	ug/L		106	(80%-120%)			

7/28/2016

GEL LABORATORIES LLC

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QC Summary

Workorder: 400517

Page 2 of 8

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
Zinc	50.0			50.7	ug/L		101	(80%-120%)	SKJ	07/20/16	22:44
QC1203578171	MB										
Aluminum			U	15.0	ug/L					07/20/16	22:40
Antimony			U	1.00	ug/L					07/22/16	15:13
Arsenic			U	1.70	ug/L					07/22/16	13:37
Barium			U	0.600	ug/L					07/20/16	22:40
Beryllium			U	0.200	ug/L						
Cadmium			U	0.110	ug/L						
Chromium			U	2.00	ug/L						
Cobalt			U	0.100	ug/L						
Copper			U	0.350	ug/L						
Lead			U	0.500	ug/L						
Manganese			U	1.00	ug/L						
Molybdenum			U	0.165	ug/L					07/21/16	14:48
Nickel			U	0.500	ug/L					07/20/16	22:40
Selenium			B	2.20	ug/L						
Silver			U	0.200	ug/L						
Strontium			U	2.00	ug/L					07/21/16	14:48
Thallium			U	0.450	ug/L					07/20/16	22:40
Thorium			B	0.402	ug/L					07/21/16	17:00
Tin			U	1.00	ug/L					07/20/16	22:40
Uranium			U	0.067	ug/L						

GEL LABORATORIES LLC

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QC Summary

Workorder: 400517

Page 3 of 8

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
Zinc			U	3.50	ug/L				SKJ	07/20/16	22:40
QC1203578173 400517002 MS											
Aluminum	2000	U	15.0	2050	ug/L		102	(75%-125%)		07/20/16	22:52
Antimony	50.0	U	1.00	58.3	ug/L		116	(75%-125%)		07/22/16	15:18
Arsenic	50.0	U	1.70	52.7	ug/L		103	(75%-125%)		07/22/16	13:45
Barium	50.0		28.1	76.2	ug/L		96.1	(75%-125%)		07/20/16	22:52
Beryllium	50.0	U	0.200	58.5	ug/L		117	(75%-125%)			
Cadmium	50.0	U	0.110	50.4	ug/L		101	(75%-125%)			
Chromium	50.0	U	2.00	51.7	ug/L		103	(75%-125%)			
Cobalt	50.0	U	0.100	49.1	ug/L		98	(75%-125%)			
Copper	50.0		10.5	59.2	ug/L		97.5	(75%-125%)			
Lead	50.0	U	0.500	53.6	ug/L		107	(75%-125%)			
Manganese	50.0	U	1.00	50.1	ug/L		99.8	(75%-125%)			
Molybdenum	50.0		0.699	51.1	ug/L		101	(75%-125%)		07/21/16	14:55
Nickel	50.0	B	0.709	49.5	ug/L		97.6	(75%-125%)		07/20/16	22:52
Selenium	50.0	BC	4.15	54.9	ug/L		102	(75%-125%)			
Silver	50.0	U	0.200	50.5	ug/L		101	(75%-125%)			
Strontium	50.0		111	165	ug/L		109	(75%-125%)		07/21/16	14:55
Thallium	50.0	U	0.450	51.4	ug/L		102	(75%-125%)		07/20/16	22:52
Thorium	50.0	BC	0.969	52.7	ug/L		103	(75%-125%)		07/21/16	17:06
Tin	50.0	U	1.00	52.7	ug/L		105	(75%-125%)		07/20/16	22:52
Uranium	50.0		0.418	55.1	ug/L		109	(75%-125%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400517

Page 4 of 8

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
Zinc	50.0	B	5.85	55.7	ug/L		99.7	(75%-125%)	SKJ	07/20/16	22:52
QC1203578174 400517002 MSD											
Aluminum	2000	U	15.0	2020	ug/L	1.22	101	(0%-20%)		07/20/16	22:56
Antimony	50.0	U	1.00	59.2	ug/L	1.46	118	(0%-20%)		07/22/16	15:19
Arsenic	50.0	U	1.70	51.5	ug/L	2.18	100	(0%-20%)		07/22/16	13:47
Barium	50.0		28.1	75.1	ug/L	1.38	94	(0%-20%)		07/20/16	22:56
Beryllium	50.0	U	0.200	58.8	ug/L	0.575	118	(0%-20%)			
Cadmium	50.0	U	0.110	51.0	ug/L	1.13	102	(0%-20%)			
Chromium	50.0	U	2.00	51.2	ug/L	0.857	102	(0%-20%)			
Cobalt	50.0	U	0.100	48.9	ug/L	0.412	97.6	(0%-20%)			
Copper	50.0		10.5	59.6	ug/L	0.699	98.3	(0%-20%)			
Lead	50.0	U	0.500	52.7	ug/L	1.57	105	(0%-20%)			
Manganese	50.0	U	1.00	50.0	ug/L	0.252	99.5	(0%-20%)			
Molybdenum	50.0		0.699	51.5	ug/L	0.836	102	(0%-20%)		07/21/16	14:58
Nickel	50.0	B	0.709	49.5	ug/L	0.0808	97.7	(0%-20%)		07/20/16	22:56
Selenium	50.0	BC	4.15	56.0	ug/L	1.99	104	(0%-20%)			
Silver	50.0	U	0.200	50.5	ug/L	0.16	101	(0%-20%)			
Strontium	50.0		111	164	ug/L	0.637	107	(0%-20%)		07/21/16	14:58
Thallium	50.0	U	0.450	50.7	ug/L	1.24	101	(0%-20%)		07/20/16	22:56
Thorium	50.0	BC	0.969	53.5	ug/L	1.54	105	(0%-20%)		07/21/16	17:07
Tin	50.0	U	1.00	51.3	ug/L	2.72	102	(0%-20%)		07/20/16	22:56
Uranium	50.0		0.418	54.9	ug/L	0.522	109	(0%-20%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 400517

Page 5 of 8

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
Zinc	50.0	B	5.85		56.6	ug/L	1.66	102	(0%-20%)	SKJ	07/20/16 22:56
QC1203578175	400517002	SDILT									
Aluminum		U	2.88	DU	75.0	ug/L	N/A		(0%-10%)		07/20/16 23:04
Antimony		U	0.260	DU	5.00	ug/L	N/A		(0%-10%)		07/22/16 15:21
Arsenic		U	1.42	DU	8.50	ug/L	N/A		(0%-10%)		07/22/16 13:50
Barium			28.1	D	5.74	ug/L	2.02		(0%-10%)		07/20/16 23:04
Beryllium		U	0.003	DU	1.00	ug/L	N/A		(0%-10%)		
Cadmium		U	-0.004	DU	0.550	ug/L	N/A		(0%-10%)		
Chromium		U	0.114	DU	10.0	ug/L	N/A		(0%-10%)		
Cobalt		U	0.078	DU	0.500	ug/L	N/A		(0%-10%)		
Copper			10.5	D	2.20	ug/L	5.04		(0%-10%)		
Lead		U	0.169	DU	2.50	ug/L	N/A		(0%-10%)		
Manganese		U	0.264	DU	5.00	ug/L	N/A		(0%-10%)		
Molybdenum			0.699	BD	0.208	ug/L	48.8		(0%-10%)		07/21/16 15:03
Nickel		B	0.709	DU	2.50	ug/L	N/A		(0%-10%)		07/20/16 23:04
Selenium		BC	4.15	DU	7.50	ug/L	N/A		(0%-10%)		
Silver		U	0.012	DU	1.00	ug/L	N/A		(0%-10%)		
Strontium			111	D	22.6	ug/L	2.17		(0%-10%)		07/21/16 15:03
Thallium		U	0.156	BD	0.458	ug/L	N/A		(0%-10%)		07/20/16 23:04
Thorium		BC	0.969	BD	0.548	ug/L	183		(0%-10%)		07/21/16 17:11
Tin		U	0.241	DU	5.00	ug/L	N/A		(0%-10%)		07/20/16 23:04
Uranium			0.418	BD	0.103	ug/L	23.2		(0%-10%)		

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1578873										
Zinc		B	5.85	DU	17.5	ug/L	N/A	(0%-10%)	SKJ	07/20/16	23:04
Metals Analysis-ICP											
Batch	1578866										
QC1203578162	LCS										
Boron	500				491	ug/L	98.1	(80%-120%)	HSC	07/08/16	15:28
Calcium	5000				4860	ug/L	97.1	(80%-120%)			
Iron	5000				4750	ug/L	95.1	(80%-120%)			
Magnesium	5000				4850	ug/L	97	(80%-120%)			
Potassium	5000				5070	ug/L	101	(80%-120%)			
Sodium	5000				4880	ug/L	97.7	(80%-120%)			
Vanadium	500				487	ug/L	97.4	(80%-120%)			
QC1203578161	MB										
Boron			U		15.0	ug/L				07/08/16	15:24
Calcium			U		50.0	ug/L					
Iron			U		30.0	ug/L					
Magnesium			U		110	ug/L					
Potassium			U		50.0	ug/L					
Sodium			U		100	ug/L					
Vanadium			U		1.00	ug/L					
QC1203578163	400517002 MS										
Boron	500	U	15.0		506	ug/L	100	(75%-125%)		07/08/16	15:46
Calcium	5000		19500		23900	ug/L	88.3	(75%-125%)			
Iron	5000	U	30.0		4770	ug/L	95.4	(75%-125%)			
Magnesium	5000		4470		9190	ug/L	94.5	(75%-125%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 400517

Page 7 of 8

Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1578866										
Potassium	5000	5580		10700	ug/L		102	(75%-125%)			
Sodium	5000	3310		8320	ug/L		100	(75%-125%)	HSC	07/08/16	15:46
Vanadium	500	B 3.60		492	ug/L		97.8	(75%-125%)			
QC1203578164 400517002 MSD											
Boron	500	U 15.0		513	ug/L	1.21	102	(0%-20%)		07/08/16	15:50
Calcium	5000	19500		24100	ug/L	0.708	91.7	(0%-20%)			
Iron	5000	U 30.0		4800	ug/L	0.504	95.9	(0%-20%)			
Magnesium	5000	4470		9230	ug/L	0.452	95.3	(0%-20%)			
Potassium	5000	5580		10700	ug/L	0.56	103	(0%-20%)			
Sodium	5000	3310		8410	ug/L	1.09	102	(0%-20%)			
Vanadium	500	B 3.60		496	ug/L	0.728	98.5	(0%-20%)			
QC1203578165 400517002 SDILT											
Boron		U 4.87	DU	75.0	ug/L	N/A		(0%-10%)		07/08/16	15:53
Calcium		19500	D	3770	ug/L	3.32		(0%-10%)			
Iron		U 0.518	DU	150	ug/L	N/A		(0%-10%)			
Magnesium		4470	D	875	ug/L	2.02		(0%-10%)			
Potassium		5580	D	1050	ug/L	5.74		(0%-10%)			
Sodium		3310	D	600	ug/L	9.24		(0%-10%)			
Vanadium		B 3.60	DU	5.00	ug/L	N/A		(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

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL400517
Work Order #: 400517**

Product: Alkalinity

Analytical Method: 2320_ALKALINITY

Analytical Procedure: GL-GC-E-033 REV# 12

Analytical Batch: 1581130

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517001	B359P0
400517002	B359T5
400517004	B35BH8
1203583373	Method Blank (MB)
1203583374	Laboratory Control Sample (LCS)
1203583375	400517001(B359P0) Sample Duplicate (DUP)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400517 GEL Work Order: 400517

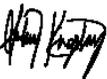
The Qualifiers in this report are defined as follows:

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: Aubrey Kingsbury

Date: 21 JUL 2016

Title: Analyst I

Sample Data Summary

7/28/2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 21, 2016

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S16-006

Client Sample ID:	B359P0	Project:	CPRC0S16006
Sample ID:	400517001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	30-JUN-16 11:18		
Receive Date:	01-JUL-16		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: GW 01 "As Received"												
Alkalinity, Total as CaCO3		96000	725	1000	ug/L			RXB5	07/12/16	1837	1581130	1
Bicarbonate alkalinity (CaCO3)		94900	725	1000	ug/L							
Carbonate alkalinity (CaCO3)		1010	725	1000	ug/L							
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L							

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

7/28/2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 21, 2016

Company : CH2MHill Plateau Remediation Company
Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF S16-006

Client Sample ID: B359T5
Sample ID: 400517002
Matrix: WATER
Collect Date: 30-JUN-16 11:35
Receive Date: 01-JUL-16
Collector: Client
Project: CPRC0S16006
Client ID: CPRC001

Table with 11 columns: Parameter, Qualifier, Result, DL, RL, Units, PF, DF, Analyst Date, Time Batch, Method. Rows include Titration and Ion Analysis and specific alkalinity measurements.

The following Analytical Methods were performed:

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 2320_ALKALINITY.

Notes:

7/28/2016

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 21, 2016

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF S16-006

Client Sample ID:	B35BH8	Project:	CPRC0S16006
Sample ID:	400517004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	30-JUN-16 07:55		
Receive Date:	01-JUL-16		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
2320_ALKALINITY: GW 01 "As Received"												
Alkalinity, Total as CaCO3		76800	725	1000	ug/L			RXB5	07/12/16	1847	1581130	1
Bicarbonate alkalinity (CaCO3)		76800	725	1000	ug/L							
Carbonate alkalinity (CaCO3)	U	725	725	1000	ug/L							
Hydroxide alkalinity as CaCO3	U	725	725	1000	ug/L							

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	2320_ALKALINITY	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 21, 2016

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1581130										
QC1203583375	400517001	DUP									
Alkalinity, Total as CaCO3		96000		96500	ug/L	0.525		(0%-20%)	RXB5	07/12/16	18:40
Bicarbonate alkalinity (CaCO3)		94900		95400	ug/L	0.531		(0%-20%)			
Carbonate alkalinity (CaCO3)		1010		1010	ug/L	0 ^		(0%-20%)			
Hydroxide alkalinity as CaCO3	U	725	U	725	ug/L	N/A					
QC1203583374	LCS										
Alkalinity, Total as CaCO3	50000			53000	ug/L		106	(80%-120%)		07/12/16	18:34
QC1203583373	MB										
Alkalinity, Total as CaCO3			U	725	ug/L					07/12/16	18:30
Bicarbonate alkalinity (CaCO3)			U	725	ug/L						
Carbonate alkalinity (CaCO3)			U	725	ug/L						
Hydroxide alkalinity as CaCO3			U	725	ug/L						

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

GEL LABORATORIES LLC

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

QC Summary

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

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

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

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

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

Radiological Analysis

Case Narrative

**Radiochemistry
 Technical Case Narrative
 CH2MHill Plateau Remediation Company (CPRC)
 SDG #: GEL400517
 Work Order #: 400517**

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: 9310_ALPHABETA_GPC

Analytical Procedure: GL-RAD-A-001 REV# 18

Analytical Batch: 1579221

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517006	B35BX0
1203579109	Method Blank (MB)
1203579110	400022003(B35BW1) Sample Duplicate (DUP)
1203579111	400022003(B35BW1) Matrix Spike (MS)
1203579112	400022003(B35BW1) Matrix Spike Duplicate (MSD)
1203579113	Laboratory Control Sample (LCS)

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

Data Summary:

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

Quality Control (QC) Information

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203579110 (B35BW1DUP), did not meet the client alpha relative error ratio requirement; However, both results are less than the MDA.

Technical Information

Gross Alpha/Beta Preparation Information

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

Recounts

Sample 1203579113 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information

Additional Comments

The matrix spike and matrix spike duplicate, 1203579111 (B35BW1MS) and 1203579112 (B35BW1MSD), aliquots were reduced to conserve sample volume.

Product: SRISO_SEP_PRECIP_GPC: COMMON

Analytical Method: SRISO_SEP_PRECIP_GPC

Analytical Procedure: GL-RAD-A-004 REV# 17

Analytical Batch: 1579902

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517005	B35BH5
400517006	B35BX0
1203580405	Method Blank (MB)
1203580406	400517005(B35BH5) Sample Duplicate (DUP)
1203580407	Laboratory Control Sample (LCS)

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

Data Summary:

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

Technical Information

Recounts

Samples 1203580406 (B35BH5DUP), 400517005 (B35BH5) and 400517006 (B35BX0) were verified by recounting at least five days from the separation date. The recounts are reported.

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Procedure: GL-RAD-A-059 REV# 4

Analytical Batch: 1578958

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517005	B35BH5
1203578395	Method Blank (MB)
1203578396	399469035(NonSDG) Sample Duplicate (DUP)
1203578397	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Procedure: GL-RAD-A-002 REV# 21

Analytical Batch: 1579141

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
400517005	B35BH5
1203578832	Method Blank (MB)
1203578833	400025001(NonSDG) Sample Duplicate (DUP)
1203578834	400025001(NonSDG) Matrix Spike (MS)
1203578835	Laboratory Control Sample (LCS)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL400517 GEL Work Order: 400517

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: 22 JUL 2016

Title: Analyst I

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400517	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 400517005	Date Collected: 06/30/2016 07:55	Matrix: WATER
	Date Received: 07/01/2016 08:55	
Client ID: B35BH5	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579902	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/18/2016 14:49	Aliquot: 300 mL	Instrument: PIC8A
Data File: S1579902r.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579902		
Prep Date: 07/11/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		6.92	pCi/L	+/-1.11	1.57	1.10	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	6.50	7.37	mg	88.3	(40%-110%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400517	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 400517005	Date Collected: 06/30/2016 07:55	Matrix: WATER
	Date Received: 07/01/2016 08:55	
Client ID: B35BH5	Method: TC99_EIE_LSC	Prep Basis: "As Received"
Batch ID: 1578958	Analyst: CXS7	SOP Ref: GL-RAD-A-059
Run Date: 07/10/2016 10:45	Aliquot: 100 mL	Instrument: LSCGREEN
Data File: E1578958.xls	Prep Method: DOE EML HASL-300, Tc-02-	Count Time: 25 min
Prep Batch: 1578958		
Prep Date: 07/05/2016 12:46		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	-4.19	pCi/L	+/-20.8	20.8	36.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	31700	35700	CPM	88.8	(30%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400517	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 400517005	Date Collected: 06/30/2016 07:55	Matrix: WATER
	Date Received: 07/01/2016 08:55	
Client ID: B35BH5	Method: TRITIUM_DIST_LSC	Prep Basis: "As Received"
Batch ID: 1579141	Analyst: TXJ1	SOP Ref: GL-RAD-A-002
Run Date: 07/14/2016 07:05	Aliquot: 50 mL	Instrument: LSCBROWN
Data File: T1579141.xls	Prep Method: EPA 906.0 Modified	Count Time: 45 min
Prep Batch: 1579141		
Prep Date: 07/13/2016 10:38		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	107	pCi/L	+/-193	194	329	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400517	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 400517006	Date Collected: 06/30/2016 11:01	Matrix: WATER
	Date Received: 07/01/2016 08:55	
Client ID: B35BX0		Prep Basis: "As Received"
Batch ID: 1579221	Method: 9310_ALPHABETA_GPC	SOP Ref: GL-RAD-A-001
Run Date: 07/13/2016 16:05	Analyst: JXC9	Instrument: LB4100H1
Data File: AB1579221r1.xls	Aliquot: 150 mL	Count Time: 140 min
Prep Batch: 1579221	Prep Method: EPA 900.0/SW846 9310	
Prep Date: 07/13/2016 09:06		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
12587-46-1	Alpha <i>ALPHA</i>	U	-0.0669	pCi/L	+/-1.42	1.42	2.94	3.00
12587-47-2	Beta <i>BETA</i>		116	pCi/L	+/-5.00	19.5	2.30	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). The MDC is a sample specific MDC.

Rad
Certificate of Analysis
Sample Summary

SDG Number: GEL400517	Client: CPRC001	Project: CPRC0S16006
Lab Sample ID: 400517006	Date Collected: 06/30/2016 11:01	Matrix: WATER
	Date Received: 07/01/2016 08:55	
Client ID: B35BX0	Method: SRISO_SEP_PRECIP_GPC	Prep Basis: "As Received"
Batch ID: 1579902	Analyst: KSD1	SOP Ref: GL-RAD-A-004
Run Date: 07/18/2016 09:09	Aliquot: 300 mL	Instrument: PIC2D
Data File: S1579902r2.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 1579902		
Prep Date: 07/11/2016 00:00		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90		61.6	pCi/L	+/-3.35	10.2	1.58	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	5.30	7.37	mg	72	(40%-110%)

Comments:

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

Quality Control Summary

7/28/2016

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 22, 2016

Page 1 of 3

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

Contact: Mr. Scot Fitzgerald

Workorder: 400517

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1579221								
QC1203579109	MB								
Alpha			U	-0.717	pCi/L			JXC9	07/13/1616:03
				Uncert: +/-0.614					
				TPU: +/-0.615					
Beta			U	0.908	pCi/L				
				Uncert: +/-2.03					
				TPU: +/-2.04					
QC1203579110	400022003	DUP							
Alpha		U	1.01	U	-1.54	pCi/L			07/13/1616:05
				Uncert: +/-1.39	+/-1.34	RPD: 0	N/A		
				TPU: +/-1.40	+/-1.34	RER: 2.58	(0-2)		
Beta			22.1		21.8	pCi/L			
				Uncert: +/-1.63	+/-1.44	RPD: 1	(0% - 20%)		
				TPU: +/-3.93	+/-3.85	RER: 0.0832	(0-2)		
QC1203579111	400022003	MS							
Alpha		240	U	1.01	252	pCi/L	REC: 105	(75%-125%)	07/13/1616:03
				Uncert: +/-1.39	+/-30.9				
				TPU: +/-1.40	+/-53.5				
Beta		875		22.1	1070	pCi/L	REC: 120	(75%-125%)	
				Uncert: +/-1.63	+/-38.4				
				TPU: +/-3.93	+/-180				
QC1203579112	400022003	MSD							
Alpha		240	U	1.01	292	pCi/L	REC: 122	(75%-125%)	
				Uncert: +/-1.39	+/-37.6		RPD: 15	(0%-20%)	
				TPU: +/-1.40	+/-63.1		RER: 0.949	(0-2)	
Beta		875		22.1	1060	pCi/L	REC: 118	(75%-125%)	
				Uncert: +/-1.63	+/-38.2		RPD: 2	(0%-20%)	
				TPU: +/-3.93	+/-177		RER: 0.125	(0-2)	
QC1203579113	LCS								
Alpha		79.9			78.3	pCi/L	REC: 98	(80%-120%)	07/18/1610:53
					Uncert: +/-7.23				
					TPU: +/-14.9				
Beta		292			349	pCi/L	REC: 120	(80%-120%)	
					Uncert: +/-12.3				
					TPU: +/-58.1				
Batch	1579902								
QC1203580405	MB								
Strontium-90			U	-1.82	pCi/L			KSD1	07/12/1613:05
				Uncert: +/-0.756					
				TPU: +/-0.756					
**Strontium Carrier		7.37			6.50	mg	REC: 88	(40%-110%)	
QC1203580406	400517005	DUP							
Strontium-90				6.92	6.32	pCi/L			07/18/1611:13
				Uncert: +/-1.11	+/-0.984		RPD: 9	(0% - 20%)	
				TPU: +/-1.57	+/-1.40		RER: 0.551	(0-2)	

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QC Summary

Workorder: 400517

Page 2 of 3

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1579902								
**Strontium Carrier	7.37	6.50		6.60	mg	REC: 90	(40%-110%)		
QC1203580407 LCS									
Strontium-90	72.9			77.9	pCi/L	REC: 107	(80%-120%)		07/12/1613:05
	Uncert:			+/-4.43					
	TPU:			+/-13.5					
**Strontium Carrier	7.37			6.60	mg	REC: 90	(40%-110%)		
Rad Liquid Scintillation									
Batch	1578958								
QC1203578395 MB									
Technetium-99			U	-3.74	pCi/L			CXS7	07/10/1611:12
	Uncert:			+/-24.1					
	TPU:			+/-24.1					
**Technetium-99m Tracer	35700			27500	CPM	REC: 77	(30%-105%)		
QC1203578396 399469035 DUP									
Technetium-99		214		204	pCi/L				07/10/1611:38
	Uncert:	+/-27.3		+/-27.6		RPD: 5	(0% - 20%)		
	TPU:	+/-36.2		+/-35.7		RER: 0.4	(0-2)		
**Technetium-99m Tracer	35700	31300		30900	CPM	REC: 87	(30%-105%)		
QC1203578397 LCS									
Technetium-99	861			819	pCi/L	REC: 95	(80%-120%)		07/10/1612:05
	Uncert:			+/-39.7					
	TPU:			+/-99.2					
**Technetium-99m Tracer	35700			31800	CPM	REC: 89	(30%-105%)		
Batch	1579141								
QC1203578832 MB									
Tritium			U	-4.81	pCi/L			TXJ1	07/14/1607:52
	Uncert:			+/-190					
	TPU:			+/-190					
QC1203578833 400025001 DUP									
Tritium		1460		1490	pCi/L				07/14/1608:39
	Uncert:	+/-246		+/-248		RPD: 2	(0% - 100%)		
	TPU:	+/-374		+/-380		RER: 0.109	(0-2)		
QC1203578834 400025001 MS									
Tritium	2330	1460		3380	pCi/L	REC: 82	(75%-125%)		07/14/1609:26
	Uncert:	+/-246		+/-316					
	TPU:	+/-374		+/-725					
QC1203578835 LCS									
Tritium	2320			1860	pCi/L	REC: 80	(80%-120%)		07/14/1610:13
	Uncert:			+/-260					
	TPU:			+/-444					

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range

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QC Summary

Workorder: 400517

Page 3 of 3

Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
A										
B										
B										
B										
C										
C										
D										
E										
E										
J										
M										
N										
P										
S										
T										
U										
UX										
W										
X										
Y										
Z										
o										

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.