

November 2, 2015



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
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gel.com

October 26, 2015

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

Re: CHPRC SAF X16-001
Work Order: 382596
SDG: GEL382596

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 06, 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,

Sarah Edwards for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA 7H
Chain of Custody: X16-001-062, X16-001-063, X16-001-064, X16-001-074 and X16-001-076
Enclosures



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Case Narrative

November 2, 2015

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X16-001
SDG: GEL382596

October 26, 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 October 06, 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:

Laboratory Identification	Sample Description
382596001	B32TL0
382596002	B32TL2
382596003	B32TK9
382596004	B32TM1
382596005	B32TM4
382596006	B32TX1
382596007	B32TX4
382596008	B32V10
382596009	B32V13

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.

November 2, 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: General Chemistry and Metals.

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 Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.



Sarah Edwards for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

X16-001-063

Page 1 of 1

382596

Collector	K.C. Patterson/CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X16-001	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271
Project Title	100-BC-5 RI, OCTOBER 2015	Logbook No.	HNF-N-50677164	Ice Chest No.	6WS-513
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	774667176976
Protocol	CERCLA	Priority:	30 Days	Offsite Property No.	6022

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

Submit deliverables & invoices to ^CPP Sample Management.

Hold Time

Total Activity Exemption: Yes No

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32TLO	N	10/05/2015	1055	1x250-mL G/P	9056_ANIONS_IC: COMMON	28 Days/48 Hours	Cool <=6C

Relinquished By K.C. Patterson/CHPRC		Date/Time OCT 05 2015 1210	Print L.D. Wall CHPRC	Sign 	Received By L.D. Wall CHPRC	Date/Time OCT 05 2015 1210	Days/Time 05 1210	Matrix *
Relinquished By L.D. Wall CHPRC		Date/Time OCT 05 2015 1400	Print FEDEX	Sign	Received By	Date/Time		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 Fealyn		Date/Time			Received By e.m.horsesey	Date/Time 10/10/15 0915		
Relinquished By		Date/Time			Received By	Date/Time		

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

Disposed By

Date/Time

90162

C.O.C.#
X16-001-064
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company

Collector: **K.C. Patterson/CHPRC** Telephone No.: **509-376-4650**

SAF No.: **X16-001** Purchase Order/Charge Code: **303271**

Project Title: **100-BC-5 RI, OCTOBER 2015** Ice Chest No.: **6005-513**

Shipped To (Lab): **GEL Laboratories, LLC** Bill of Lading/Air Bill No.: **77466717 6976**

Protocol: **CERCLA** Priority: **30 Days** Offsite Property No.: **6022**

Contact/Requester: **Karen Waters-Husted** Sampling Origin: **Hanford Site**

Logbook No.: **HNF-N-506 77164** Method of Shipment: **Commercial Carrier**

PRIORITY

SPECIAL INSTRUCTIONS Hold Time: No Yes
 Submit deliverables & invoices to ^CPP Sample Management.

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
B32TM1	N	W OCT 05 2015	1133	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B32TM1	N	W		1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B32TM1	N	W		1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B32TM4	Y	W		1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

November 2, 2015

Relinquished By: **K.C. Patterson/CHPRC** Print: *[Signature]* Sign: *[Signature]* Date/Time: **OCT 05 2015 1200**

Received By: **L.D. Wall** Print: *[Signature]* Sign: *[Signature]* Date/Time: **OCT 05 2015 1200**

Relinquished By: **L.D. Wall** Print: *[Signature]* Sign: *[Signature]* Date/Time: **OCT 05 2015 1400**

Received By: **CHPRC** Print: **FEDEX** Sign: *[Signature]* Date/Time: **OCT 05 2015 0915**

Relinquished By: **Feal** Print: *[Signature]* Sign: *[Signature]* Date/Time: **10/10/15 0915**

Received By: **CHPRC** Print: *[Signature]* Sign: *[Signature]* Date/Time: **10/10/15 0915**

Matrix *

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

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

Disposed By: _____ Date/Time: _____

PRINTED ON 9/28/2015 FSR ID = FSR5277 A-6004-842 (REV 2)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

X16-001-062

Page 1 of 1

Collector **K.C. Patterson/CHPRC** Contact/Requester **Karen Waters-Husted** Telephone No. **509-376-4650**

SAF No. **X16-001** Sampling Origin **Hanford Site** Purchase Order/Charge Code **303271**

Project Title **100-BC-5 RI, OCTOBER 2015** Logbook No. **HNF-N-506 771,64** Ice Chest No. **6005-513**

Shipped To (Lab) **GEL Laboratories, LLC** Method of Shipment **Commercial Carrier** Bill of Lading/Air Bill No. **774667176976**

Protocol **CERCLA** Priority: **30 Days** Offsite Property No. **6022**

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
 Submit deliverables & invoices to ^CpP Sample Management.

Sample No.	Filter	* W	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32TL2	Y	W	OCT 05 2015	1055	1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B32TK9	N	W			1x250-mL GIP	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B32TK9	N	W			1x500-mL GIP	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B32TK9	N	W			1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

Relinquished By K.C. Patterson/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time OCT 05 2015 1200	Received By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time OCT 05 2015 1200
Relinquished By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time OCT 05 2015 1400	Received By FEDEX	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time OCT 05 2015 0915
Relinquished By [Signature]	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time [Signature]	Received By [Signature]	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time [Signature]

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

Disposed By

Date/Time

November 2, 2015

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # X16-001-074

Page 1 of 1

Collector: **S.W. King/CHPRC** Contact/Requester: **Karen Waters-Husted** Telephone No.: **509-376-4650**

SAF No.: **X16-001** Sampling Origin: **Hanford Site** Purchase Order/Charge Code: **303271**

Project Title: **100-BC-5 RI, OCTOBER 2015** Logbook No.: **HNF-N-506 75189** Ice Chest No.: **605-513**

Shipped To (Lab): **GEL Laboratories, LLC** Method of Shipment: **Commercial Carrier** Bill of Lading/Air Bill No.: **77466717 6976**

Protocol: **CERCLA** Priority: **30 Days** Priority: **PRIORITY** Offsite Property No.: **6022**

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: No Yes
 Submit deliverables & invoices to ^CPP Sample Management.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32TX1	N	W	10-2-15	1115	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B32TX1	N	W	/	/	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B32TX1	N	W	/	/	1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B32TX4	Y	W	10-2-15	1115	1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

November 2, 2015

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
S.W. King/CHPRC			OCT 02 2015 1300	SSU-1			OCT 02 2015 1300	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
Relinquished By			Date/Time	Received By			Date/Time	
SSU-1			OCT 05 2015 1100	L.D. Wall CHPRC			OCT 05 2015 1100	
Relinquished By			Date/Time	Received By			Date/Time	
L.D. Wall CHPRC			OCT 05 2015 1400	FEDEX			OCT 05 2015 1400	
Relinquished By			Date/Time	Received By			Date/Time	
Felex				Cheseaseague / unyarselle 10/02/15 0915				

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # X16-001-076
Page 1 of 1

Collector **K.C. Patterson/GHPRC** Contact/Requester **Karen Waters-Husted** Telephone No. **509-376-4650**
 SAF No. **X16-001** Sampling Origin **Hanford Site** Purchase Order/Charge Code **303271**
 Project Title **100-BC-5 RI, OCTOBER 2015** Logbook No. **HNF-N-506 77/64** Ice Chest No. **5425-513**
 Shipped To (Lab) **GEL Laboratories, LLC** Method of Shipment **Commercial Carrier** Bill of Lading/Air Bill No. **7746 6717 6976**
 Protocol **CERCLA** Priority: **30 Days** **PRIORITY** Offsite Property No. **60022**

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

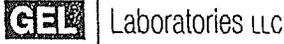
Sample No.	Filter *	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32V10	N	OCT 05 2015	0911	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B32V10	N			1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2
B32V10	N			1x250-mL aG	9060_TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B32V13	Y			1x500-mL G/P	6020_METALS_ICPMS: GW 01; 6010_METALS_ICP: GW 04	6 Months	HNO3 to pH <2

November 2, 2015

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
K.C. Patterson/GHPRC			OCT 05 2015 1030	F.M. Hall/GHPRC			OCT 05 2015 1030	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By			Date/Time	Received By			Date/Time	
F.M. Hall/GHPRC			OCT 05 2015 1100	FEDEX				
Relinquished By			Date/Time	Received By			Date/Time	
11 of 7				PHUSENSEAGLE			10/16/15 0915	
Relinquished By			Date/Time	Received By			Date/Time	
11 of 7								

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

November 2, 2015



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>	SDG/AR/COC/Work Order:
Received By: <u>CSJ</u>	Date Received: <u>10/16/15</u>
Suspected Hazard Information	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 cpm</u>
Classified Radioactive II or III by RSO?	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	

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 ≤ deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <input checked="" type="checkbox"/> Ice bags <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other (describe) *all temperatures are recorded in Celsius <u>1.5°C</u>
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>EAD092024932</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 have headspace as required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7	VOA vials contain acid preservation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If unknown, select No)
8	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:
9	Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
11	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:
12	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
13	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
14	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>7746 6717 6976</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 $\geq 2X$ the MDA and, after corrections, result is \geq 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 \geq 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 \geq 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 26 October 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	P330-15-00283, P330-15-00253
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	SC000122016-1
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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-19
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Metals Analysis

Case Narrative

November 2, 2015

Metals

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL382596

Work Order #: 382596

Sample ID	Client ID
382596002	B32TL2
382596003	B32TK9
382596004	B32TM1
382596005	B32TM4
382596006	B32TX1
382596007	B32TX4
382596008	B32V10
382596009	B32V13
1203406869	Method Blank (MB)ICP
1203406870	Laboratory Control Sample (LCS)
1203406873	382596002(B32TL2L) Serial Dilution (SD)
1203406871	382596002(B32TL2S) Matrix Spike (MS)
1203406872	382596002(B32TL2SD) Matrix Spike Duplicate (MSD)
1203406880	Method Blank (MB)ICP-MS
1203406881	Laboratory Control Sample (LCS)
1203406884	382596002(B32TL2L) Serial Dilution (SD)
1203406882	382596002(B32TL2S) Matrix Spike (MS)
1203406883	382596002(B32TL2SD) Matrix Spike Duplicate (MSD)

Sample Analysis

Samples 382596 002, 003, 004, 005, 006, 007, 008 and 009 in this SDG were analyzed for metals on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1512971 and 1512976
Prep Batch :	1512970 and 1512975
Standard Operating Procedures:	GL-MA-E-013 REV# 24, GL-MA-E-006 REV# 13 and GL-MA-E-014 REV# 26
Analytical Method:	6010_METALS_ICP and 6020_METALS_ICPMS
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 CRDL/PQL standard recoveries met the referenced advisory control limits.

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: 382596002 (B32TL2)-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.

November 2, 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: GEL382596 GEL Work Order: 382596

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: Nik-Cole Elmore

Date: 02 NOV 2015

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596002

CLIENT ID: B32TL2

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	3.51	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	11.6	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15.1	ug/L	B		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	37900	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	12	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	8570	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	3.65	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	0.885	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	5320	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	13100	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	142	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.46	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596002

CLIENT ID: B32TL2

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	9.57	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	4.14	ug/L	B		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596003

CLIENT ID: B32TK9

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	3.82	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	11.7	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	38000	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	13.3	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	8580	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	3.74	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	1.32	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	5330	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	12800	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	148	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.46	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596003

CLIENT ID: B32TK9

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	9.63	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596004

CLIENT ID: B32TM1

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	2.88	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	23.1	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	16.1	ug/L	B		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	47000	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	31.6	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.359	ug/L	B		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	467	ug/L			P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	8500	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	37.3	ug/L			MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	2.85	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	1.11	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	4680	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	12400	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	191	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.49	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596004

CLIENT ID: B32TM1

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	5.08	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	6.01	ug/L	B		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596005

CLIENT ID: B32TM4

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	2.63	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	22.7	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15.2	ug/L	B		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	47200	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	26.8	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.426	ug/L	B		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	207	ug/L			P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	8570	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	6.8	ug/L			MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	2.91	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	0.66	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	4670	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	12800	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	195	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.51	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596005

CLIENT ID: B32TM4

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	4.8	ug/L	B		P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.77	ug/L	B		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

P SW846 3005A/6010C

MS SW846 3005A/6020A

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596006

CLIENT ID: B32TX1

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	2.81	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	24.1	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	31000	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	32	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.93	ug/L	B		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	7820	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	1.61	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	4610	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	8080	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	163	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.44	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
 -1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596006

CLIENT ID: B32TX1

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	15.8	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	151028-2

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596007

CLIENT ID: B32TX4

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	2.66	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	24	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	31600	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	32.4	ug/L			MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.613	ug/L	B		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	7980	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	1.62	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	4670	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	8120	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	165	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.46	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596007

CLIENT ID: B32TX4

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	15.1	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596008

CLIENT ID: B32V10

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	20.4	ug/L	B		MS	15	1	ICPMS12	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	3.33	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	13	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	37000	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	6.39	ug/L	B		MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30.6	ug/L	B		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	9760	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1.18	ug/L	B		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	2.36	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	1.56	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	5230	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	11100	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	152	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.35	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596008

CLIENT ID: B32V10

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	9.97	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596009

CLIENT ID: B32V13

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	151028-2
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS12	151030-3
7440-38-2	Arsenic	3.43	ug/L	B		MS	1.7	1	ICPMS12	151028-2
7440-39-3	Barium	12.9	ug/L			MS	0.6	1	ICPMS12	151028-2
7440-41-7	Beryllium	0.2	ug/L	U		MS	0.2	1	ICPMS12	151028-2
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	100915-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS12	151028-2
7440-70-2	Calcium	37300	ug/L			P	50	1	OPTIMA3	100915-1
7440-47-3	Chromium	4.27	ug/L	B		MS	2	1	ICPMS12	151028-2
7440-48-4	Cobalt	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-50-8	Copper	0.35	ug/L	U		MS	0.35	1	ICPMS12	151028-2
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	100915-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS12	151028-2
7439-95-4	Magnesium	10000	ug/L			P	110	1	OPTIMA3	100915-1
7439-96-5	Manganese	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7439-98-7	Molybdenum	2.31	ug/L			MS	0.165	1	ICPMS12	151030-3
7440-02-0	Nickel	0.712	ug/L	B		MS	0.5	1	ICPMS12	151028-2
7440-09-7	Potassium	5230	ug/L			P	50	1	OPTIMA3	100915-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS12	151028-2
7440-22-4	Silver	0.1	ug/L	U		MS	0.1	1	ICPMS12	151028-2
7440-23-5	Sodium	12000	ug/L			P	100	1	OPTIMA3	100915-1
7440-24-6	Strontium	151	ug/L			MS	2	1	ICPMS12	151028-2
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS12	151028-2
7440-29-1	Thorium	0.383	ug/L	U		MS	0.383	1	ICPMS12	151028-2
7440-31-5	Tin	1	ug/L	U		MS	1	1	ICPMS12	151028-2
7440-61-1	Uranium	1.36	ug/L			MS	0.067	1	ICPMS12	151028-2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL382596

METHOD TYPE: SW846

SAMPLE ID: 382596009

CLIENT ID: B32V13

CONTRACT: CPRC0X16001

MATRIX: WATER

DATE RECEIVED 06-OCT-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	10.2	ug/L			P	1	1	OPTIMA3	100915-1
7440-66-6	Zinc	3.5	ug/L	U		MS	3.5	1	ICPMS12	151028-2

*Analytical Methods:

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

Quality Control Summary

November 2, 2015
GEL LABORATORIES LLC

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

QC Summary

Report Date: November 2, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 382596

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
QC1203406881	LCS										
Aluminum	2000			1790	ug/L		89.7	(80%-120%)	BAJ	10/28/15	20:28
Antimony	50.0			52.4	ug/L		105	(80%-120%)		10/31/15	00:05
Arsenic	50.0			51.1	ug/L		102	(80%-120%)		10/28/15	20:28
Barium	50.0			48.4	ug/L		96.8	(80%-120%)			
Beryllium	50.0			55.7	ug/L		111	(80%-120%)			
Cadmium	50.0			50.6	ug/L		101	(80%-120%)			
Chromium	50.0			49.4	ug/L		98.7	(80%-120%)			
Cobalt	50.0			48.5	ug/L		97.1	(80%-120%)			
Copper	50.0			49.1	ug/L		98.2	(80%-120%)			
Lead	50.0			48.8	ug/L		97.7	(80%-120%)			
Manganese	50.0			49.8	ug/L		99.6	(80%-120%)			
Molybdenum	50.0			53.3	ug/L		107	(80%-120%)		10/31/15	00:05
Nickel	50.0			51.9	ug/L		104	(80%-120%)		10/28/15	20:28
Selenium	50.0			50.0	ug/L		100	(80%-120%)			
Silver	50.0			51.0	ug/L		102	(80%-120%)			
Strontium	50.0			48.6	ug/L		97.1	(80%-120%)			
Thallium	50.0			48.0	ug/L		95.9	(80%-120%)			
Thorium	50.0			48.6	ug/L		97.1	(80%-120%)			
Tin	50.0			50.1	ug/L		100	(80%-120%)			
Uranium	50.0			49.0	ug/L		98	(80%-120%)			

November 2, 2015
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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
Zinc	50.0			52.1	ug/L		104	(80%-120%)	BAJ	10/28/15	20:28
QC1203406880	MB										
Aluminum			U	15.0	ug/L					10/28/15	20:26
Antimony			U	1.00	ug/L					10/31/15	00:04
Arsenic			U	1.70	ug/L					10/28/15	20:26
Barium			U	0.600	ug/L						
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					10/31/15	00:04
Nickel			U	0.500	ug/L					10/28/15	20:26
Selenium			U	1.50	ug/L						
Silver			U	0.100	ug/L						
Strontium			U	2.00	ug/L						
Thallium			U	0.450	ug/L						
Thorium			U	0.383	ug/L						
Tin			U	1.00	ug/L						
Uranium			U	0.067	ug/L						

November 2, 2015
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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
Zinc			U	3.50	ug/L				BAJ	10/28/15	20:26
QC1203406882	382596002 MS										
Aluminum	2000	U	15.0	1810	ug/L		90.1	(75%-125%)		10/28/15	20:34
Antimony	50.0	U	1.00	52.5	ug/L		104	(75%-125%)		10/31/15	00:09
Arsenic	50.0	B	3.51	55.2	ug/L		103	(75%-125%)		10/28/15	20:34
Barium	50.0		11.6	57.9	ug/L		92.5	(75%-125%)			
Beryllium	50.0	U	0.200	54.1	ug/L		108	(75%-125%)			
Cadmium	50.0	U	0.110	49.7	ug/L		99.3	(75%-125%)			
Chromium	50.0		12.0	59.9	ug/L		95.9	(75%-125%)			
Cobalt	50.0	U	0.100	47.7	ug/L		95.4	(75%-125%)			
Copper	50.0	U	0.350	46.6	ug/L		92.6	(75%-125%)			
Lead	50.0	U	0.500	48.4	ug/L		96.8	(75%-125%)			
Manganese	50.0	U	1.00	48.2	ug/L		96.1	(75%-125%)			
Molybdenum	50.0		3.65	57.4	ug/L		108	(75%-125%)		10/31/15	00:09
Nickel	50.0	B	0.885	49.8	ug/L		97.9	(75%-125%)		10/28/15	20:34
Selenium	50.0	U	1.50	51.2	ug/L		100	(75%-125%)			
Silver	50.0	U	0.100	49.9	ug/L		99.8	(75%-125%)			
Strontium	50.0		142	193	ug/L		101	(75%-125%)			
Thallium	50.0	U	0.450	47.5	ug/L		95	(75%-125%)			
Thorium	50.0	U	0.383	49.9	ug/L		99.3	(75%-125%)			
Tin	50.0	U	1.00	49.6	ug/L		98.9	(75%-125%)			
Uranium	50.0		1.46	50.4	ug/L		98	(75%-125%)			

November 2, 2015
GEL LABORATORIES LLC

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QC Summary

Workorder: **382596**

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
Zinc	50.0	B	4.14	49.0	ug/L		89.7	(75%-125%)	BAJ	10/28/15	20:34
QC1203406883	382596002 MSD										
Aluminum	2000	U	15.0	1800	ug/L	0.301	89.8	(0%-20%)		10/28/15	20:36
Antimony	50.0	U	1.00	52.2	ug/L	0.56	104	(0%-20%)		10/31/15	00:10
Arsenic	50.0	B	3.51	54.5	ug/L	1.41	102	(0%-20%)		10/28/15	20:36
Barium	50.0		11.6	57.7	ug/L	0.313	92.2	(0%-20%)			
Beryllium	50.0	U	0.200	55.2	ug/L	1.94	110	(0%-20%)			
Cadmium	50.0	U	0.110	49.8	ug/L	0.247	99.6	(0%-20%)			
Chromium	50.0		12.0	61.3	ug/L	2.31	98.6	(0%-20%)			
Cobalt	50.0	U	0.100	48.5	ug/L	1.62	97	(0%-20%)			
Copper	50.0	U	0.350	48.0	ug/L	3.01	95.5	(0%-20%)			
Lead	50.0	U	0.500	47.3	ug/L	2.27	94.6	(0%-20%)			
Manganese	50.0	U	1.00	49.1	ug/L	1.97	98	(0%-20%)			
Molybdenum	50.0		3.65	57.5	ug/L	0.171	108	(0%-20%)		10/31/15	00:10
Nickel	50.0	B	0.885	51.0	ug/L	2.43	100	(0%-20%)		10/28/15	20:36
Selenium	50.0	U	1.50	50.0	ug/L	2.39	97.8	(0%-20%)			
Silver	50.0	U	0.100	50.1	ug/L	0.332	100	(0%-20%)			
Strontium	50.0		142	196	ug/L	1.53	106	(0%-20%)			
Thallium	50.0	U	0.450	46.7	ug/L	1.74	93.4	(0%-20%)			
Thorium	50.0	U	0.383	48.6	ug/L	2.74	96.6	(0%-20%)			
Tin	50.0	U	1.00	50.1	ug/L	1.03	100	(0%-20%)			
Uranium	50.0		1.46	49.9	ug/L	1.03	96.9	(0%-20%)			

November 2, 2015
GEL LABORATORIES LLC

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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
Zinc	50.0	B	4.14		48.9	ug/L	0.121	89.6	(0%-20%)	BAJ	10/28/15 20:36
QC1203406884	382596002	SDILT									
Aluminum		U	6.79	DU	75.0	ug/L	N/A	(0%-10%)			10/28/15 20:41
Antimony		U	0.261	DU	5.00	ug/L	N/A	(0%-10%)			10/31/15 00:12
Arsenic		B	3.51	DU	8.50	ug/L	N/A	(0%-10%)			10/28/15 20:41
Barium			11.6	D	2.33	ug/L	.241	(0%-10%)			
Beryllium		U	0.016	DU	1.00	ug/L	N/A	(0%-10%)			
Cadmium		U	0.049	DU	0.550	ug/L	N/A	(0%-10%)			
Chromium			12.0	D	2.73	ug/L	13.9	(0%-10%)			
Cobalt		U	0.032	DU	0.500	ug/L	N/A	(0%-10%)			
Copper		U	0.266	DU	1.75	ug/L	N/A	(0%-10%)			
Lead		U	0.019	DU	2.50	ug/L	N/A	(0%-10%)			
Manganese		U	0.140	DU	5.00	ug/L	N/A	(0%-10%)			
Molybdenum			3.65	D	0.876	ug/L	20.1	(0%-10%)			10/31/15 00:12
Nickel		B	0.885	DU	2.50	ug/L	N/A	(0%-10%)			10/28/15 20:41
Selenium		U	1.12	DU	7.50	ug/L	N/A	(0%-10%)			
Silver		U	0.009	DU	0.500	ug/L	N/A	(0%-10%)			
Strontium			142	D	29.1	ug/L	2.1	(0%-10%)			
Thallium		U	-0.025	DU	2.25	ug/L	N/A	(0%-10%)			
Thorium		U	0.290	DU	1.92	ug/L	N/A	(0%-10%)			
Tin		U	0.104	DU	5.00	ug/L	N/A	(0%-10%)			
Uranium			1.46	D	0.316	ug/L	8.29	(0%-10%)			

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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1512976										
Zinc		B	4.14	DU	17.5	ug/L	N/A	(0%-10%)	BAJ	10/28/15	20:41

Metals Analysis-ICP											
Batch	1512971										
QC1203406870	LCS										
Boron	500				507	ug/L		101	(80%-120%)	HSC	10/09/15 15:31
Calcium	5000				4840	ug/L		96.8	(80%-120%)		
Iron	5000				5050	ug/L		101	(80%-120%)		
Magnesium	5000				5020	ug/L		100	(80%-120%)		
Potassium	5000				5100	ug/L		102	(80%-120%)		
Sodium	5000				5350	ug/L		107	(80%-120%)		
Vanadium	500				514	ug/L		103	(80%-120%)		

QC1203406869	MB										
Boron				U	15.0	ug/L					10/09/15 15:28
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					

QC1203406871	382596002	MS									
Boron	500	B	15.1		540	ug/L		105	(75%-125%)		10/09/15 15:38
Calcium	5000		37900		42900	ug/L		N/A	(75%-125%)		
Iron	5000	U	30.0		5000	ug/L		100	(75%-125%)		
Magnesium	5000		8570		13600	ug/L		99.6	(75%-125%)		

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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1512971										
Potassium	5000	5320		10400	ug/L		102	(75%-125%)			
Sodium	5000	13100		18200	ug/L		102	(75%-125%)	HSC	10/09/15	15:38
Vanadium	500	9.57		530	ug/L		104	(75%-125%)			
QC1203406872 382596002 MSD											
Boron	500	B	15.1	540	ug/L	0.00926	105	(0%-20%)		10/09/15	15:41
Calcium	5000		37900	43500	ug/L	1.28	N/A	(0%-20%)			
Iron	5000	U	30.0	5000	ug/L	0.038	99.9	(0%-20%)			
Magnesium	5000		8570	13600	ug/L	0.214	100	(0%-20%)			
Potassium	5000		5320	10500	ug/L	1.17	105	(0%-20%)			
Sodium	5000		13100	18100	ug/L	0.893	98.5	(0%-20%)			
Vanadium	500		9.57	531	ug/L	0.224	104	(0%-20%)			
QC1203406873 382596002 SDILT											
Boron		B	15.1	DU	75.0	ug/L	N/A	(0%-10%)		10/09/15	15:44
Calcium			37900	D	7490	ug/L	1.24	(0%-10%)			
Iron		U	1.91	DU	150	ug/L	N/A	(0%-10%)			
Magnesium			8570	D	1640	ug/L	4.1	(0%-10%)			
Potassium			5320	D	1000	ug/L	5.78	(0%-10%)			
Sodium			13100	D	2540	ug/L	3.4	(0%-10%)			
Vanadium			9.57	D	1.95	ug/L	2.13	(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 #: GEL382596
Work Order #: 382596**

Method/Analysis Information

Product: Carbon and Total Organic
Analytical Batch: 1514268 **Method:** 9060_TOC: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060A:

Sample ID	Client ID
382596003	B32TK9
382596004	B32TM1
382596006	B32TX1
382596008	B32V10
1203409926	Method Blank (MB)
1203409927	Laboratory Control Sample (LCS)
1203409928	382021002(B326V9) Sample Duplicate (DUP)
1203409929	382145001(B33114) Sample Duplicate (DUP)
1203409930	382596006(B32TX1) Sample Duplicate (DUP)
1203409931	382021002(B326V9) Post Spike (PS)
1203409932	382145001(B33114) Post Spike (PS)
1203409933	382596006(B32TX1) Post Spike (PS)

Samples 382596 003, 004, 006 and 008 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-GC-E-093 REV# 13.

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.

Calibration Information

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 382021002 (B326V9), 382145001 (B33114) and 382596006 (B32TX1) were selected for QC analysis.

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

The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

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. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1512885 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
382596001	B32TL0
1203406647	Method Blank (MB)
1203406648	Laboratory Control Sample (LCS)
1203406649	382596001(B32TL0) Sample Duplicate (DUP)
1203406650	382596001(B32TL0) Post Spike (PS)

Sample 382596 001 in this SDG was 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-GC-E-086 REV# 24.

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.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 382596001 (B32TL0) was selected for QC analysis.

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

The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.

Analyte	Sample	Value
Chloride	1203406650 (B32TL0PS)	113* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203406649 (B32TL0DUP), 1203406650 (B32TL0PS) and 382596001 (B32TL0).

Analyte	382596
	001
Sulfate	10X

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1455557 was generated for sample 1203406650 (B32TL0PS) in this SDG/batch.

Manual Integrations

Samples 1203406649 (B32TL0DUP), 1203406650 (B32TL0PS) and 382596001 (B32TL0) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

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. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1514559 **Method:** 2320_ALKALINITY: COMMON (Alkalinity only)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in 2320_ALKALINITY:

Sample ID	Client ID
382596003	B32TK9
382596004	B32TM1
382596006	B32TX1
382596008	B32V10
1203410671	Method Blank (MB)
1203410672	Laboratory Control Sample (LCS)
1203410673	382748003(B32LL4) Sample Duplicate (DUP)

Samples 382596 003, 004, 006 and 008 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-GC-E-033 REV# 11.

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.

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 382748003 (B32LL4) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

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. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

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.

November 2, 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: GEL382596 GEL Work Order: 382596

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

Review/Validation

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

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

Signature: 

Name: Thomas Lewis

Date: 30 OCT 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Report Date: October 30, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X16-001

Client Sample ID: B32TL0	Project: CPRC0X16001
Sample ID: 382596001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-OCT-15 10:55	
Receive Date: 06-OCT-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON "As Received"											
Chloride		6770	67.0	200	ug/L	1	RXB5	10/06/15	1404	1512885	1
Fluoride	B	268	33.0	500	ug/L	1					
Nitrate-N		1250	33.0	250	ug/L	1					
Nitrite-N	U	38.0	38.0	250	ug/L	1					
Sulfate	D	31400	1330	4000	ug/L	10	RXB5	10/06/15	1539	1512885	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

Notes:

Certificate of Analysis

Report Date: October 30, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X16-001

Client Sample ID: B32TK9	Project: CPRC0X16001
Sample ID: 382596003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-OCT-15 10:55	
Receive Date: 06-OCT-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
9060_TOC: COMMON "As Received"											
Total Organic Carbon #1	B	572	330	1000	ug/L	1	TSM	10/22/15	0100	1514268	1
Total Organic Carbon #2	B	568	330	1000	ug/L	1					
Total Organic Carbon #3	B	573	330	1000	ug/L	1					
Total Organic Carbon #4	B	570	330	1000	ug/L	1					
Total Organic Carbon Average	B	571	330	1000	ug/L	1					

Titration and Ion Analysis

2320_ALKALINITY: COMMON (Alkalinity only) "As Received"											
Alkalinity, Total as CaCO3		113000	725	1000	ug/L		AMB	10/14/15	1657	1514559	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	2320_ALKALINITY	

Notes:

Certificate of Analysis

Report Date: October 30, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X16-001

Client Sample ID: B32TM1	Project: CPRC0X16001
Sample ID: 382596004	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-OCT-15 11:33	
Receive Date: 06-OCT-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
9060_TOC: COMMON "As Received"											
Total Organic Carbon #1	B	971	330	1000	ug/L	1	TSM	10/22/15	0142	1514268	1
Total Organic Carbon #2	B	991	330	1000	ug/L	1					
Total Organic Carbon #3	B	987	330	1000	ug/L	1					
Total Organic Carbon #4		1000	330	1000	ug/L	1					
Total Organic Carbon Average	B	988	330	1000	ug/L	1					
Titration and Ion Analysis											
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"											
Alkalinity, Total as CaCO3		111000	725	1000	ug/L		AMB	10/14/15	1659	1514559	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	2320_ALKALINITY	

Notes:

Certificate of Analysis

Report Date: October 30, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X16-001

Client Sample ID: B32TX1	Project: CPRC0X16001
Sample ID: 382596006	Client ID: CPRC001
Matrix: WATER	
Collect Date: 02-OCT-15 11:15	
Receive Date: 06-OCT-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
9060_TOC: COMMON "As Received"											
Total Organic Carbon #1	U	330	330	1000	ug/L	1	TSM	10/22/15	0224	1514268	1
Total Organic Carbon #2	U	330	330	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	ug/L	1					
Total Organic Carbon #4	U	330	330	1000	ug/L	1					
Total Organic Carbon Average	U	330	330	1000	ug/L	1					
Titration and Ion Analysis											
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"											
Alkalinity, Total as CaCO3		94900	725	1000	ug/L		AMB	10/14/15	1702	1514559	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	2320_ALKALINITY	

Notes:

Certificate of Analysis

Report Date: October 30, 2015

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X16-001

Client Sample ID: B32V10	Project: CPRC0X16001
Sample ID: 382596008	Client ID: CPRC001
Matrix: WATER	
Collect Date: 05-OCT-15 09:11	
Receive Date: 06-OCT-15	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
9060_TOC: COMMON "As Received"											
Total Organic Carbon #1	U	330	330	1000	ug/L	1	TSM	10/22/15	0429	1514268	1
Total Organic Carbon #2	U	330	330	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	ug/L	1					
Total Organic Carbon #4	U	330	330	1000	ug/L	1					
Total Organic Carbon Average	U	330	330	1000	ug/L	1					
Titration and Ion Analysis											
2320_ALKALINITY: COMMON (Alkalinity only) "As Received"											
Alkalinity, Total as CaCO3		114000	725	1000	ug/L		AMB	10/14/15	1703	1514559	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	2320_ALKALINITY	

Notes:

Quality Control Summary

November 2, 2015
GEL LABORATORIES LLC

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QC Summary

Report Date: October 30, 2015

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 382596

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1514268										
QC1203409928	382021002	DUP									
Total Organic Carbon Average		1050		1060	ug/L	0.951	^	(+/-1000)	TSM	10/20/15	20:56
QC1203409929	382145001	DUP									
Total Organic Carbon Average		1250		1250	ug/L	0.24	^	(+/-1000)		10/20/15	23:44
QC1203409930	382596006	DUP									
Total Organic Carbon Average	U	330	U	330	ug/L	N/A				10/22/15	03:06
QC1203409927	LCS										
Total Organic Carbon Average	10000			10100	ug/L			101 (85%-115%)		10/20/15	20:00
QC1203409926	MB										
Total Organic Carbon Average			U	330	ug/L					10/20/15	19:46
QC1203409931	382021002	PS									
Total Organic Carbon Average	10.0	1.05		11.3	mg/L			103 (65%-120%)		10/20/15	21:39
QC1203409932	382145001	PS									
Total Organic Carbon Average	10.0	1.25		11.5	mg/L			103 (65%-120%)		10/21/15	00:26
QC1203409933	382596006	PS									
Total Organic Carbon Average	10.0	U	0.189	10.6	mg/L			104 (65%-120%)		10/22/15	03:47
Ion Chromatography											
Batch	1512885										
QC1203406649	382596001	DUP									
Chloride		6770		6770	ug/L	0.096		(0%-20%)	RXB5	10/06/15	14:36
Fluoride	B	268	B	269	ug/L	0.298	^	(+/-500)			
Nitrate-N		1250		1250	ug/L	0.136		(+/-250)			
Nitrite-N	U	38.0	U	38.0	ug/L	N/A					
Sulfate	D	31400	D	31600	ug/L	0.406		(0%-20%)		10/06/15	16:10
QC1203406648	LCS										
Chloride	5000			4770	ug/L			95.4 (90%-110%)		10/06/15	13:33
Fluoride	2500			2420	ug/L			96.9 (90%-110%)			

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QC Summary

Workorder: 382596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1512885										
Nitrate-N	2500			2420	ug/L		96.8	(90%-110%)			
Nitrite-N	2500			2420	ug/L		96.7	(90%-110%)	RXB5	10/06/15	13:33
Sulfate	10000			9840	ug/L		98.4	(90%-110%)			
QC1203406647 MB											
Chloride			U	67.0	ug/L					10/06/15	13:02
Fluoride			U	33.0	ug/L						
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L						
Sulfate			U	133	ug/L						
QC1203406650 382596001 PS											
Chloride	5.00	6.77		12.4	mg/L		113*	(90%-110%)		10/06/15	15:07
Fluoride	2.50	B 0.268		2.73	mg/L		98.3	(90%-110%)			
Nitrate-N	2.50	1.25		3.75	mg/L		100	(90%-110%)			
Nitrite-N	2.50	U 0.00		2.47	mg/L		98.8	(90%-110%)			
Sulfate	10.0	D 3.14	D	13.3	mg/L		102	(90%-110%)		10/06/15	16:41
Titration and Ion Analysis											
Batch	1514559										
QC1203410673 382748003 DUP											
Alkalinity, Total as CaCO3		88900		89400	ug/L	0.567		(0%-20%)	AMB	10/14/15	17:33
QC1203410672 LCS											
Alkalinity, Total as CaCO3	50000			52500	ug/L		105	(90%-110%)		10/14/15	16:46
QC1203410671 MB											
Alkalinity, Total as CaCO3			U	725	ug/L					10/14/15	16:46

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

November 2, 2015

GEL LABORATORIES LLC

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QC Summary

Workorder: 382596

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

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.

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 08-OCT-15	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1512885	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 382596(GEL382596)			
Application Issues: Failed Recovery for MS/MSD, or PS/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203406650PS</p>		<p>1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. Chloride 1203406650 (B32TL0PS) [113* (90%-110%)].</p>	

Originator's Name:

Rachael Bell 08-OCT-15

Data Validator/Group Leader:

Marcy Lamb 21-OCT-15