

OCTOBER 3, 2014



a member of **The GEL Group** INC



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October 03, 2014

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

Re: CHPRC SAF W14-009  
Work Order: 356205  
SDG: GEL356205

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 06, 2014. 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,

A handwritten signature in cursive script that reads "Heather Shaffer".

Heather Shaffer  
Project Manager

Purchase Order: 300071ES20  
Chain of Custody: W14-009-069, W14-009-070 and W14-009-129  
Enclosures



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# Case Narrative

**General Narrative  
for  
Hanford MSA (51204)  
CHPRC SAF W14-009  
SDG: GEL356205**

**October 03, 2014**

**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 September 06, 2014, 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:

<b>Laboratory Identification</b>	<b>Sample Description</b>
356205001	B2XK70
356205002	B2XKL0
356205003	B2XK62
356205004	B2XKL1
356205005	B2XKL2
356205006	B2XK66
356205007	B2XKL6
356205008	B2XKL7
356205009	B2XKL8

**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.

OCTOBER 3, 2014

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. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

*Heather Shaffer*

Heather Shaffer  
Project Manager

# **Chain of Custody and Supporting Documentation**

2266800

CH2M Hill Plateau Remediation Company		C.O.C. # W14-009-129	
S.W. King CHPRC		Page 1 of 1	
Collector	W14-009	Telephone No.	509-376-4650
SAF No.	RCRA, SEPTEMBER 2014	Purchase Order/Charge Code	300071ES20
Project Title	TestAmerica St. Louis- 6E2	Ice Chest No.	6WS-425
Shipped To (Lab)	KS 9/4/14	Bill of Lading/Air Bill No.	7710 6077 6284
Protocol	RCRA	Offsite Property No.	5063
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> *** 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 Priority: 30 Days Priority: <b>PRIORITY</b>	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No.	B2XX70	No/Type Container	1x500-mL P
Filter	N	Sample Analysis	300.0_ANIONS_IC: COMMON
Date	SEP 05 2014 0905	Holding Time	48 Hours
Time		Preservative	Cool <=6C

Relinquished By S.W. King CHPRC	Print [Signature]	Sign	Date/Time SEP 05 2014	Received By F.M. Hall CHPRC	Print [Signature]	Sign	Date/Time SEP 05 2014	Matrix *
Relinquished By F.M. Hall CHPRC	Print [Signature]	Sign	Date/Time SEP 05 2014	Received By FEDEX	Print [Signature]	Sign	Date/Time SEP 05 2014	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By [Signature]	Print [Signature]	Sign	Date/Time SEP 05 2014	Received By P. Hunt	Print [Signature]	Sign	Date/Time 9/16/14 0900	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By [Signature]	Print [Signature]	Sign	Date/Time SEP 05 2014	Received By [Signature]	Print [Signature]	Sign	Date/Time [Signature]	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By		Date/Time		

867175

**CH2MHill Plateau Remediation**  
**Company**  
**CHRIS FULTON**  
**CHPRC**  
**W14-009**  
**Project Title**  
**RCRA, SEPTEMBER 2014**  
**Shipped To (Lab)**  
**GEL Laboratories, LLC**  
**Protocol**  
**RCRA**

**Collector**  
**CHRIS FULTON**  
**CHPRC**  
**SAF No.**  
**W14-009**  
**Project Title**  
**RCRA, SEPTEMBER 2014**  
**Shipped To (Lab)**  
**GEL Laboratories, LLC**  
**Protocol**  
**RCRA**

**Contact/Requester**  
**Karen Waters-Husted**  
**Sampling Origin**  
**Hanford Site**  
**Logbook No.**  
**HNF-N-506 65 / 90**  
**Method of Shipment**  
**Commercial Carrier**  
**Priority:**  
**30 Days**  
**PRIORITY**

**Telephone No.**  
**509-376-4650**  
**Purchase Order/Charge Code**  
**30007IES20**  
**Ice Chest No.**  
**6ws-425**  
**Bill of Lading/Air Bill No.**  
**7710 6077 6284**  
**Offsite Property No.**  
**5063**

**C.O.C. #**  
**W14-009-069**  
**Page 1 of 1**

**Special Instructions**  
**Hold Time**  
**SPECIAL INSTRUCTIONS**  
**Hold Time**  
**Total Activity Exemption:** Yes  No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2XKLO	N	W	9-5-14	0848	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKLO	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XK62	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XK62	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XKL1	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKL1	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XKL2	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKL2	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

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

Received By	Date/Time	Print	Sign	Date/Time	Received By	Date/Time	Print	Sign	Date/Time	Received By	Date/Time	Print	Sign	Date/Time	Matrix *
F.M. Hall	1015			9-5-14	CHPRC	1015			9-5-14	F.M. Hall	1015			1015	S = Soil
CHPRC	1400			9-5-14	FEDEX	1400			9-5-14	CHPRC	1400			1400	SE = Sediment
FEDEX	2014			SEP 05 2014		2014			SEP 05 2014		2014			2014	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

**CH2M Hill Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

C.O.C. # **W14-009-070**  
Page 1 of 1

**Collector** CHRIS FULTON CHPRC  
**SAF No.** W14-009  
**Project Title** RCRA, SEPTEMBER 2014  
**Shipped To (Lab)** GEL Laboratories, LLC  
**Protocol** RCRA

**Contact/Requester** Karen Waters-Husted  
**Sampling Origin** Hanford Site  
**Logbook No.** HNF-N-506 45 / 90  
**Method of Shipment** Commercial Carrier  
**Priority:** 30 Days **PRIORITY**

**Telephone No.** 509-376-4650  
**Purchase Order/Charge Code** 300071ES20  
**Ice Chest No.** GWS-425  
**Bill of Lading/Air Bill No.** 7710 6077 6284  
**Offsite Property No.** 5063

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

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Hold Time	Preservative
B2XK66	N	W	9-5-14	0439	1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XK66	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XKL6	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKL6	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XKL7	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKL7	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2XKL8	N	W			1x1-L aGs*	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B2XKL8	N	W			1x250-mL aG	9060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool <=6C

**Relinquished By** CHRIS FULTON CHPRC  
**Received By** F.M. Hall CHPRC  
**Relinquished By** F.M. Hall CHPRC  
**Received By** FEDEX  
**Relinquished By** F.D.A.  
**Received By**

**Date/Time** 9-5-14  
**Date/Time** 9-5-14  
**Date/Time** SEP 05 2014  
**Date/Time** 9/6/14 0900

**Print** **Sign** **Print** **Sign**

**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

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

**Disposed By**

**Disposal Date/Time**

**GEL** Laboratories LLC

**SAMPLE RECEIPT & REVIEW FORM**

Client: <u>HMSA</u>		SDG/AR/COC/Work Order: <u>356205</u>	
Received By: <u>P. A. Dent</u>		Date Received: <u>9/6/14</u>	
<b>Suspected Hazard Information</b>	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0/cpm</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <u>2c</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<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"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other  <u>7710 6077 6284-2c</u>

Comments (Use Continuation Form if needed):

# **Data Review Qualifier Definitions**

## Project Specific Qualifier Definitions for GEL Client Code: HMSA

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

# Laboratory Certifications

## List of current GEL Certifications as of 03 October 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122014-14
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

# General Chem Analysis

# Case Narrative

**General Chemistry Narrative  
Hanford MSA (HMSA)  
SDG GEL356205**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1417191

**Method:** 9060\_TOC: COMMON

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
356205002	B2XKL0
356205003	B2XK62
356205004	B2XKL1
356205005	B2XKL2
356205006	B2XK66
356205007	B2XKL6
356205008	B2XKL7
356205009	B2XKL8
1203162502	MB for batch 1417191
1203162503	Laboratory Control Sample (LCS)
1203162504	356205002(B2XKL0) Sample Duplicate (DUP)
1203162505	356205002(B2XKL0) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 12.

**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 Model 1010 Total Organic 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**

The following sample was selected for QC analysis: 356205002 (B2XKL0).

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

The MS/PS recovery for this sample set was 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:** Total Organic Halogens (TOX)  
**Analytical Batch:** 1417662 **Method:** 9020\_TOX: COMMON

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in 9020\_TOX:

<b>Sample ID</b>	<b>Client ID</b>
356205002	B2XKL0
356205003	B2XK62
356205004	B2XKL1
356205005	B2XKL2
356205006	B2XK66
356205007	B2XKL6
356205008	B2XKL7
356205009	B2XKL8
1203163793	MB for batch 1417662
1203163794	Laboratory Control Sample (LCS)
1203163795	356205002(B2XKL0) Sample Duplicate (DUP)
1203163796	356205002(B2XKL0) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-007 REV# 14.

**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 Halogen analysis was performed on a Mitsubishi AOX-200.

**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**

The following sample was selected for QC analysis: 356205002 (B2XKL0).

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

The MS/PS recovery for this sample set was within the required acceptance limits.

**Duplicate Relative Percent Difference (RPD) Statement**

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203163795 (B2XKL0).

**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**

A pair of nitrate wash blanks is analyzed at the start of the batch. Although they are designated as ICB, they are performed for calculating purposes only. The value of the nitrate wash blanks are averaged and subtracted from all

samples. Neither of these values should exceed 0.6 ug Cl. The PQL limit typically applied to ICB results does not apply in this application, since the results are used only to determine background concentrations and are subtracted from all calculated results.

**Breakthrough effect**

No breakthrough effects were observed for samples in this batch. Breakthrough effect: If the value for a sample is greater than the reporting limit (10 ug/L), the result for the second slug should not be greater than 25% of the combined value of the first and second slug. Results which do not meet these criteria are designated with a "Fail" comment in the Breakthrough effect column on the Logbook page; however, the "fail" designation is not applicable for samples with a result of less than 10 ug/L.

**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:** 1417110**Method:** 9056\_ANIONS\_IC: COMMON**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
356205001	B2XK70
1203162271	MB for batch 1417110
1203162272	Laboratory Control Sample (LCS)
1203162273	356211001(B2XFX0) Sample Duplicate (DUP)
1203162274	356211001(B2XFX0) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

**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-3000 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**

The following sample was selected for QC analysis: 356211001 (B2XFX0).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203162274 (B2XFX0). The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203162274 (B2XFX0).

**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**

All samples diluted at a 2X per client request. 1203162273 (B2XFX0), 1203162274 (B2XFX0) and 356205001 (B2XK70).

**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.

**Manual Integrations**

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203162273 (B2XFX0) and 356205001 (B2XK70).

**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.

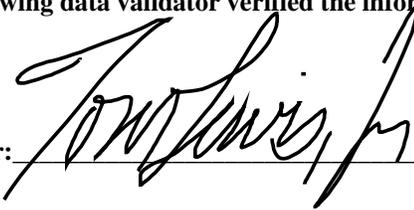
**Certification Statement**

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.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer:  Date: 03Oct14

# Sample Data Summary

**GEL LABORATORIES LLC**

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

**Certificate of Analysis Report  
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL356205 GEL Work Order: 356205

**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.

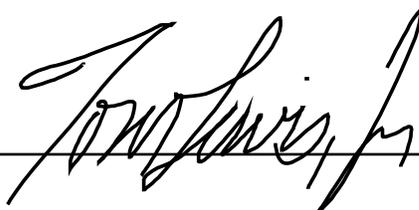
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by



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**GEL LABORATORIES LLC**

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

**Certificate of Analysis**

Company : CH2MHill Plateau Remediation  
 Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XK70  
 Lab Sample ID: 356205001  
 Matrix: WATER  
 Collect Date: 05-SEP-14 09:05  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>												
<i>9056_ANIONS_IC: COMMON "As Received"</i>												
Chloride	D	5340	134	400	200	ug/L	2	RXB5	09/06/14	12:27	1417110	1
Fluoride	BD	430	66.0	200	500	ug/L	2					
Nitrate-N	D	2470	66.0	200	250	ug/L	2					
Nitrite-N	DU	76.0	76.0	200	250	ug/L	2					
Sulfate	D	16300	266	800	500	ug/L	2					

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9056A	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL0  
 Lab Sample ID: 356205002  
 Matrix: WATER  
 Collect Date: 05-SEP-14 08:48  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	427	330	1000	1000	ug/L	1	TSM	09/11/14	21:00	1417191	1
Total Organic Carbon #2	B	539	330	1000	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	433	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	429	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens	U	3.33	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	16:14	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XK62  
 Lab Sample ID: 356205003  
 Matrix: WATER  
 Collect Date: 05-SEP-14 08:48  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	336	330	1000	1000	ug/L	1	TSM	09/11/14	22:01	1417191	1
Total Organic Carbon #2	B	469	330	1000	1000	ug/L	1					
Total Organic Carbon #3	B	334	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	397	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	384	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens	B	3.74	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	18:02	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL1  
 Lab Sample ID: 356205004  
 Matrix: WATER  
 Collect Date: 05-SEP-14 08:48  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	364	330	1000	1000	ug/L	1	TSM	09/11/14	22:35	1417191	1
Total Organic Carbon #2	B	447	330	1000	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon #4	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	360	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens	B	4.50	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	19:07	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL2  
 Lab Sample ID: 356205005  
 Matrix: WATER  
 Collect Date: 05-SEP-14 08:48  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	353	330	1000	1000	ug/L	1	TSM	09/11/14	23:44	1417191	1
Total Organic Carbon #2	B	382	330	1000	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon #4	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon Average	U	330	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens	B	3.72	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	19:37	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XK66  
 Lab Sample ID: 356205006  
 Matrix: WATER  
 Collect Date: 05-SEP-14 09:39  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	386	330	1000	1000	ug/L	1	TSM	09/12/14	00:18	1417191	1
Total Organic Carbon #2	B	480	330	1000	1000	ug/L	1					
Total Organic Carbon #3	B	351	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	409	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	406	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens	B	9.82	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	20:30	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL6  
 Lab Sample ID: 356205007  
 Matrix: WATER  
 Collect Date: 05-SEP-14 09:39  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	412	330	1000	1000	ug/L	1	TSM	09/12/14	00:52	1417191	1
Total Organic Carbon #2	B	423	330	1000	1000	ug/L	1					
Total Organic Carbon #3	U	330	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	348	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	378	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens		12.7	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	21:33	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL7  
 Lab Sample ID: 356205008  
 Matrix: WATER  
 Collect Date: 05-SEP-14 09:39  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	401	330	1000	1000	ug/L	1	TSM	09/12/14	01:25	1417191	1
Total Organic Carbon #2	B	479	330	1000	1000	ug/L	1					
Total Organic Carbon #3	B	387	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	427	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	424	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens		13.3	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	22:35	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

**GEL LABORATORIES LLC**

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**Certificate of Analysis**

Company : CH2MHill Plateau Remediation Company  
 Address : MSIN R3-50 CHPRC  
 PO Box 1600  
 Richland, Washington 99352  
 Contact: Mr. Scot Fitzgerald  
 Project: **CHPRC SAF W14-009**

Report Date: October 3, 2014

Client Sample ID: B2XKL8  
 Lab Sample ID: 356205009  
 Matrix: WATER  
 Collect Date: 05-SEP-14 09:39  
 Receive Date: 06-SEP-14  
 Collector: Client

Project: HMSA0W14009  
 Client ID: HMSA001  
 Client SDG: GEL356205

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>												
<i>9060_TOX: COMMON "As Received"</i>												
Total Organic Carbon #1	B	450	330	1000	1000	ug/L	1	TSM	09/12/14	01:59	1417191	1
Total Organic Carbon #2	B	475	330	1000	1000	ug/L	1					
Total Organic Carbon #3	B	418	330	1000	1000	ug/L	1					
Total Organic Carbon #4	B	414	330	1000	1000	ug/L	1					
Total Organic Carbon Average	B	439	330	1000	1000	ug/L	1					
<b>Halogen Analysis</b>												
<i>9020_TOX: COMMON "As Received"</i>												
Total Organic Halogens		10.4	3.33	10.0	10.0	ug/L	1	RMJ	09/29/14	23:16	1417662	2

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	SW846 9060A	
2	9020_TOX	

# Quality Control Summary

**GEL LABORATORIES LLC**

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

**QC Summary**

Report Date: October 3, 2014

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 356205

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1417191										
QC1203162504	356205002	DUP									
Total Organic Carbon Average	B	429	B	410	ug/L	4.53	^	(+/-1000)	TSM	09/11/14	21:33
QC1203162503	LCS										
Total Organic Carbon Average	10000			10200	ug/L			(85%-115%)		09/11/14	23:36
QC1203162502	MB										
Total Organic Carbon Average			U	ND	ug/L					09/11/14	23:27
QC1203162505	356205002	PS									
Total Organic Carbon Average	10.0	B	0.429	11.0	mg/L			(65%-120%)		09/11/14	21:53
<b>Halogen Analysis</b>											
Batch	1417662										
QC1203163795	356205002	DUP									
Total Organic Halogens		U	ND	B	3.98	ug/L	48.8	(+/-10.0)	RMJ	09/29/14	16:39
QC1203163794	LCS										
Total Organic Halogens	100			100	ug/L			(75%-118%)		09/29/14	15:51
QC1203163793	MB										
Total Organic Halogens			U	ND	ug/L					09/29/14	15:30
QC1203163796	356205002	PS									
Total Organic Halogens	100	U	ND	105	ug/L			(45%-174%)		09/29/14	17:22
<b>Ion Chromatography</b>											
Batch	1417110										
QC1203162273	356211001	DUP									
Chloride		D	11600	D	11700	ug/L	0.308	(0%-20%)	RXB5	09/06/14	14:00
Fluoride		BD	301	BD	298	ug/L	0.935	^	(+/-500)		
Nitrate-N		D	9890	D	9920	ug/L	0.303	(0%-20%)			
Nitrite-N		DU	ND	DU	ND	ug/L	N/A				
Sulfate		D	30600	D	30600	ug/L	0.0471	(0%-20%)			
QC1203162272	LCS										
Chloride	5000			4710	ug/L			94.2	(90%-110%)	09/06/14	16:35

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**QC Summary**

Workorder: 356205

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1417110										
Fluoride	2500			2440	ug/L		97.7	(90%-110%)			
Nitrate-N	2500			2340	ug/L		93.8	(90%-110%)	RXB5	09/06/14	16:35
Nitrite-N	2500			2400	ug/L		96.1	(90%-110%)			
Sulfate	10000			9690	ug/L		96.9	(90%-110%)			
QC1203162271 MB											
Chloride			U	ND	ug/L					09/06/14	16:04
Fluoride			U	ND	ug/L						
Nitrate-N			U	ND	ug/L						
Nitrite-N			U	ND	ug/L						
Sulfate			U	ND	ug/L						
QC1203162274 356211001 PS											
Chloride	5.00	D	5.81	D	11.2	mg/L	109	(90%-110%)		09/06/14	14:31
Fluoride	2.50	BD	0.150	D	2.57	mg/L	96.6	(90%-110%)			
Nitrate-N	2.50	D	4.94	D	7.74	mg/L	112*	(90%-110%)			
Nitrite-N	2.50	DU	ND	D	2.38	mg/L	95.3	(90%-110%)			
Sulfate	10.0	D	15.3	D	26.0	mg/L	107	(90%-110%)			

**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

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**QC Summary**

Workorder: 356205

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