



October 02, 2014

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

Re: CHPRC SAF I14-035
Work Order: 354598
SDG: GEL354598

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 13, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. Rev 01 for this data package is revised per attached SIR & P&D.

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,

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: I14-035-029, I14-035-030, I14-035-031, I14-035-034, I14-035-035, I14-035-053 and
I14-035-054
Enclosures



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Sample Issue Resolution

SAMPLE ISSUE RESOLUTION

SIR NUM	SDR14-367
REV NUM	0
DATE INITIATED	9/19/2014

SAMPLE EVENT INFORMATION

SAF NUM(S) I14-035
OPERABLE UNIT(S) 100-KR-4
PROJECT(S) CERC14
SAMPLE EVENT TITLE(S) CERC14
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 11
SAMPLE NUMBERS B2X601, B2X603, B2X604, B2X607, B2X626, B2X628, B2X630, B2X6H0, B2X6H1, B2X6H6, B2X6H7
SAMPLE MATRIX WATER
COLLECTION DATE 8/11/2014 - 8/12/2014
SDG NUM GEL354598

ISSUE BACKGROUND

CLASS Laboratory Issue
TYPE Chain of Custody Issue
DESCRIPTION All pages of the COC are missing printed names for Sarah Edwards

DISPOSITION

DESCRIPTION PROPOSED DISPOSTION: Correct COCs and resubmit

JUSTIFICATION ACCEPTED RESOLUTION:

SUBMITTED BY: Kira Murray Date: 9/18/2014
ACCEPTED BY:

Problem and Discrepancy Report

Problem and Discrepancy Report

GEL

SDG GEL354598

9/30/14

1. The data package has the following issues:

- The metals case narrative says that there are MB detects above the MDL but below the RL for arsenic and selenium. The QC shows that the MB detects are actually Arsenic and Molybdenum, not selenium. Please correct the narrative.

Resolution: *Provide correction.*

Lab Response:

The Metals Case Narrative will be corrected per above issue.

Provide a resolution to each issue noted on the report

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Case Narrative

Rev 01 for this data package is revised per attached SIR & P&D.

**General Narrative
for
Hanford MSA (51204)
CHPRC SAF I14-035
SDG: GEL354598**

October 02, 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 August 13, 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:

<u>Laboratory Identification</u>	<u>Sample Description</u>
354598001	B2X607
354598002	B2X601
354598003	B2X604
354598004	B2X603
354598005	B2X630
354598006	B2X626
354598007	B2X628
354598008	B2X6H6
354598009	B2X6H0
354598010	B2X6H7
354598011	B2X6H1

Case Narrative

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

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, General Chemistry, Metals and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.



Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **114-035-029**
 Page 1 of 1

Collector: S.W. King
 CHPRC
 Telephone No. 509-376-4650
 Purchase Order/Charge Code 300071ES20
 SAF No. 114-035
 Sampling Origin Hanford Site
 Project Title 100KR4, AUGUST 2014
 Logbook No. HNF-N-506 68/82
 Ice Chest No. 605S-121 307
 Shipped To (Lab) GEL Laboratories, LLC
 Method of Shipment Commercial Carrier
 Bill of Lading/Air Bill No. 770818914572
 Protocol CERCLA
 Priority: 30 Days
 Offsite Property No. 5001

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
 All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.
 Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2X607	Y	W	AUG 12 2014	0901	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B2X601	N	W	★	★	1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B2X601	N	W	AUG 12 2014	0901	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2

334598

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
S.W. King			AUG 12 2014 1139	L.D. Wall	CHPRC	S.D. Wall	AUG 12 2014 1139	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			AUG 12 2014 1400	Received By	FEDEX			DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By				Received By		Sarah Edwards	8.13.14/0900	
Relinquished By				Received By				

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 PRINTED ON 6/25/2014
 A-6004-842 (REV 2)

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **114-035-030**
Page 1 of 1

Telephone No. 509-376-4650

Collector **S.W. King**
CHPRC
114-035

Contact/Requester **Karen Waters-Husted**

Project Title **100KR4, AUGUST 2014**

Sampling Origin **Hanford Site**

SAF No. **114-035**

Logbook No. **HNF-N-506**

Purchase Order/Charge Code **300071ES20**

Method of Shipment **Commercial Carrier**

Ice Chest No. **605S-121307**

Bill of Lading/Air Bill No. **770818914592**

Shipped To (Lab) **GEL Laboratories, LLC**

Priority: **30 Days**

Offsite Property No. **5001**

Protocol **CERCLA**

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

Total Activity Exemption: Yes No

All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.
Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Sample No. **B2X604**

Filter **N**

Date **12 AUG 2014**

Time **0901**

No/Type Container **1x250-mL G/P**

Sample Analysis **9056_ANIONS_IC: COMMON**

Holding Time **28 Days/48 Hours**

Preservative **Cool <=6C**

Relinquished By S.W. King CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1131	Received By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1131	Matrix *
Relinquished By L.D. Wall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1400	Received By Sarah Edwards	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 8.13.14/0900	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 Fed Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1400	Received By Sarah Edwards	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 8.13.14/0900	
Relinquished By Fed Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1400	Received By Sarah Edwards	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time 8.13.14/0900	

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

FINAL SAMPLE DISPOSITION

PRINTED O 6/25/2014

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

C.O.C. # 114-035-031
Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: S.W. King
CHPRC
114-035

Contact/Requester: Karen Waters-Husted

Telephone No. 509-376-4650

SAF No. 100KR4, AUGUST 2014

Sampling Origin: Hanford Site

Purchase Order/Charge Code: 30007IES20

Project Title: GEL Laboratories, LLC

Logbook No. HNF-N-506 68182

Ice Chest No. 605-121307

Method of Shipment: Commercial Carrier

Bill of Lading/Air Bill No. 770818914592

Shipped To (Lab): CERCLA

Offsite Property No. 501

Priority: 30 Days

PRIORITY

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
All Labs except WSCE: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.
Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Total Activity Exemption: Yes No

Sample No. B2X603

Filter: N

No/Type Container: 1x500-mL aG

7196_CR6: COMMON

Time: AUG 12 2014 0901

Holding Time: 24 Hours

Preservative: Cool <=6C

Relinquished By S.W. King CHPRC	Print <i>[Signature]</i>	Sign	Date/Time AUG 12 2014 1139	Received By L.D. Wall CHPRC	Print L.D. Wall	Sign <i>[Signature]</i>	Date/Time AUG 12 2014 1139	Matrix *
Relinquished By L.D. Wall CHPRC	Print L.D. Wall	Sign	Date/Time AUG 12 2014 1400	Received By FEDEX	Print FEDEX	Sign	Date/Time AUG 12 2014 1400	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By Fed Ex	Print Fed Ex	Sign	Date/Time AUG 12 2014 1400	Received By <i>[Signature]</i>	Print <i>[Signature]</i>	Sign Sarah Edwards	Date/Time 8.13.14/0900	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)			Disposed By		Date/Time		

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CH2M Hill Plateau Remediation Company

C.O.C. # I14-035-034

Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: S.W. King
CHPRC

Contact/Requester: Karen Waters-Husted

Telephone No.: 509-376-4650

SAF No.: I14-035

Sampling Origin: Hanford Site

Purchase Order/Charge Code: 30007IES20

Project Title: 100KR4, AUGUST 2014

Logbook No.: HNF-N-506-10881

Ice Chest No.: 605-363

Shipped To (Lab): GEL Laboratories, LLC

Method of Shipment: Commercial Carrier

Bill of Lading/Air Bill No.: 770808719223

Protocol: CERCLA

Priority: 30 Days

Offsite Property No.: 4995

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

All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.

Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2X630	Y	W	AUG 11 2014	1112	1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B2X626	N	W			1x250-mL G/P	2320_ALKALINITY: GW 01	14 Days	Cool <=6C
B2X626	N	W			1x500-mL G/P	6020_METALS_ICPMS: GW 01	6 Months	HNO3 to pH <2
B2X626	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON; 8260_VOA_GCMS: GW 01	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2X626	N	W			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B2X626	N	W			1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B2X626	N	W			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B2X626	N	W	AUG 11 2014	1112	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

Relinquished By: S.W. King
CHPRC
Date/Time: AUG 11 2014 1130
Sign: [Signature]

Received By: M. Hall
CHPRC
Date/Time: AUG 11 2014
Sign: [Signature]

Relinquished By: M. Hall
CHPRC
Date/Time: AUG 11 2014
Sign: [Signature]

Received By: Sarah Edwards
Edwards
Date/Time: 8.13.14/0900
Sign: [Signature]

Relinquished By: Fed Ex
Date/Time: [Blank]
Sign: [Blank]

Received By: [Blank]
Date/Time: [Blank]
Sign: [Blank]

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, used in process)

Disposed By

Date/Time

PRINTED O 6/25/2014

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CH2MHill Plateau Remediation Company		C.O.C. # I14-035-035	
S.W. King CHPRC		Page 1 of 1	
Collector	S.W. King CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	I14-035	Telephone No.	509-376-4650
Project Title	100KR4, AUGUST 2014	Purchase Order/Charge Code	300071ES20
Shipped To (Lab)	GEL Laboratories, LLC	Ice Chest No.	6ws-365
Protocol	CERCLA	Bill of Lading/Air Bill No.	1770808719223
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	Priority: 30 Days	Offsite Property No.	4995
	SPECIAL INSTRUCTIONS All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days. Submit deliverables & invoices to Scott Fitzgerald, CHPRC.	Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No.	B2X628	Sample Analysis	Preservative
Filter	N	Holding Time	Cool <=6C
No/Type Container	1x250-mL G/P		
Time	11/2		
Date	AUG 11 2014		

Relinquished By S.W. King CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By F.M. Hall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 11 2014	Date/Time 11/30
Relinquished By F.M. Hall CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By FEDEX	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 11 2014	Date/Time AUG 1 2014
Relinquished By Fed Ex	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By Sarah Edwards CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Date/Time AUG 11 2014	Date/Time 8.13.14/0900
Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time	Date/Time

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FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time
PRINTED O 6/25/2014	Disposed By	A-6004-842 (REV 2)

CH2M Hill Plateau Remediation Company

C.O.C. # 114-035-053

Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: S.W. King
CHPRC

Contact/Requester: Karen Waters-Husted

Telephone No. 509-376-4650

SAF No. I14-035

Purchase Order/Charge Code 30007IES20

Project Title 100KR4, AUGUST 2014

Logbook No. HNF-N-506 68/8/

Ice Chest No. GWS-152

Shipped To (Lab) GEL Laboratories, LLC

Method of Shipment Commercial Carrier

Bill of Lading/Air Bill No. 7708 0872 0043

Protocol CERCLA

Priority: 30 Days

Offsite Property No. 4995

POSSIBLE SAMPLE HAZARDS/REMARKS

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No

All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.

Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2X6H6	Y	W	AUG 11 2014	1000	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6 Months	HNO3 to pH <2
B2X6H0	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6 Months	HNO3 to pH <2
B2X6H0	N	W			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B2X6H0	N	W			1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B2X6H0	N	W	AUG 11 2014	1000	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2

Relinquished By: S.W. King
CHPRC

Print: [Signature]

Received By: F.M. Hall
CHPRC

Date/Time: AUG 11 2014 1130

Sign: [Signature]

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

Relinquished By: F.M. Hall
CHPRC

Print: [Signature]

Received By: FEDEX

Date/Time: AUG 11 2014 1400

Sign: [Signature]

Relinquished By: Fed Ex

Print: [Signature]

Received By: Sarah Edwards
Edwards

Date/Time: 8.13.14 / 0900

Sign: [Signature]

Relinquished By: [Signature]

Print: [Signature]

Received By: [Signature]

Date/Time: [Signature]

Sign: [Signature]

Received By: [Signature]

Date/Time: [Signature]

FINAL SAMPLE DISPOSITION

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

Disposed By

Date/Time

PRINTED O 6/25/2014

A-6004-842 (REV 2)

CH2M Hill Plateau Remediation Company
 C.O.C.# **114-035-054**
 Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: S.W. King
CHPRC
SAF No.: 114-035
Project Title: 100KR4, AUGUST 2014
Shipped To (Lab): GEL Laboratories, LLC
Protocol: CERCLA

Contact/Requester: Karen Waters-Husted
Telephone No.: 509-376-4650
Sampling Origin: Hanford Site
Purchase Order/Charge Code: 300071ES20
Logbook No.: HNF-N-506 108/81
Ice Chest No.: GWS-152
Method of Shipment: Commercial Carrier
Bill of Lading/Air Bill No.: 1700008720043
Priority: 30 Days
Offsite Property No.: 4995

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
POSSIBLE SAMPLE HAZARDS/REMARKS
 All Labs except WSCF: Batch all samples submitted under A, G, I, S, and W14 SAFs into one SDG, not to exceed SDG closure of 14 days.
 Submit deliverables & invoices to Scott Fitzgerald, CHPRC.

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2X6H7	Y	AUG 11 2014	1000	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6 Months	HNO3 to pH <2
B2X6H1	N			1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6 Months	HNO3 to pH <2
B2X6H1	N			1x4-L G/P	GAMMA_GS: COMMON; GAMMA_GS: GW 01	6 Months	HNO3 to pH <2
B2X6H1	N			1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B2X6H1	N	AUG 11 2014	1000	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
S.W. King CHPRC			AUG 11 2014 1130	M. Hall CHPRC			AUG 11 2014 1130	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
F.M. Hall CHPRC			AUG 11 2014 1400	FEDEX				DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Fed Ex				Sarah Edwards FEDEX			8.13.14/0900	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time
 A-6004-842 (REV 2)
 PRINTED ON 6/25/2014

Client: <u>HMSA</u>		SDG/AR/COC/Work Order: <u>354598</u>	
Received By: <u>SE</u>		Date Received: <u>8.13.14</u>	
Suspected Hazard Information		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"/>	<input type="checkbox"/>
Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u>			
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, Were swipes taken of sample containers < action levels?			
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
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"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Hazard Class Shipped: _____ UN#: _____	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius <u>2</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>130532792</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	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:
7	Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9	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:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7708 1891 4592</u> <u>7708 0871 9223</u> <u>7708 0872 0043</u> <u>7708 0871 9830</u> <u>7708 0872 0150</u>

Comments (Use Continuation Form if needed):



770808720043

Ship (P/U) date :
Mon 8/11/2014 2:41 pm
 Richland, WA US



Delivered

Signed for by: M.KINSLOW

Actual delivery :
Wed 8/13/2014 9:01 am
 CHARLESTON, SC US

4 Piece shipment

Let us tell you when your shipment arrives. Sign up for delivery notifications

Travel History

Date/Time	Activity	Location
- 8/13/2014 - Wednesday		
9:01 am	Delivered	CHARLESTON, SC
6:55 am	On FedEx vehicle for delivery	CHARLESTON, SC
6:51 am	At local FedEx facility	CHARLESTON, SC
- 8/12/2014 - Tuesday		
2:54 pm	Departed FedEx location	MEMPHIS, TN
5:33 am	In transit	MEMPHIS, TN
12:58 am	Arrived at FedEx location	MEMPHIS, TN
- 8/11/2014 - Monday		
5:07 pm	Left FedEx origin facility	PASCO, WA
2:41 pm	Picked up	PASCO, WA
3:43 pm	Shipment information sent to FedEx	

Local Scan Time

Shipment Facts

Tracking number	770808720043	Service	FedEx Priority Overnight
Master tracking number	770808719223	Weight	91 lbs
Delivered To	Shipping/Receiving	Total pieces	4
Total shipment weight	91 lbs / 41.28 kgs	Shipper reference	2EK00 303064/2898/0072 ES10
Packaging	Your Packaging	Special handling section	Deliver Weekday



770808719223

Ship (P/U) date :
Mon 8/11/2014 2:41 pm
 Richland, WA US



Delivered
 Signed for by: M.KINSLOW

Actual delivery :
Wed 8/13/2014 9:01 am
 CHARLESTON, SC US

4 Piece shipment

Let us tell you when your shipment arrives. Sign up for delivery notifications

Travel History

Date/Time	Activity	Location
- 8/13/2014 - Wednesday		
9:01 am	Delivered	CHARLESTON, SC
6:55 am	On FedEx vehicle for delivery	CHARLESTON, SC
6:52 am	At local FedEx facility	CHARLESTON, SC
- 8/12/2014 - Tuesday		
2:54 pm	Departed FedEx location	MEMPHIS, TN
5:33 am	In transit	MEMPHIS, TN
12:58 am	Arrived at FedEx location	MEMPHIS, TN
- 8/11/2014 - Monday		
5:07 pm	Left FedEx origin facility	PASCO, WA
2:41 pm	Picked up	PASCO, WA
3:43 pm	Shipment information sent to FedEx	

Local Scan Time

Shipment Facts

Tracking number	770808719223	Service	FedEx Priority Overnight
Master tracking number	770808719223	Weight	85 lbs
Delivered To	Shipping/Receiving	Total pieces	4
Total shipment weight	299 lbs / 135.62 kgs	Shipper reference	2EK00 303064/2898/0072 ES10
Packaging	Your Packaging	Special handling section	Deliver Weekday

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556-8171

Report Date: 30-SEP-14

Project Specific Qualifier Definitions for GEL Client Code: HMSA

Revision #1 03-OCT-2014

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 02 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

Volatile Analysis

Case Narrative

**ChemStation Case Narrative
Hanford MSA (HMSA)
SDG GEL354598**

Method/Analysis Information

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

Analytical Method: SW846 8260C

Analytical Batch Number: 1412995

Sample Analysis

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

Sample ID	Client ID
354598006	B2X626
1203151935	Method Blank (MB)
1203151936	354598006(B2X626) Post Spike (PS)
1203151937	354598006(B2X626) Post Spike Duplicate (PSD)
1203151938	Laboratory Control Sample (LCS)
1203151939	Laboratory Control Sample (LCS)
1203151960	354598006(B2X626) Post Spike (PS)
1203151961	354598006(B2X626) Post Spike Duplicate (PSD)

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

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

SOP Reference

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

Calibration Information

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

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information**Blank (MB) Statement**

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 354598006 (B2X626) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike 1203151936 (B2X626) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate 1203151937 (B2X626) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information**Holding Time Specifications**

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

Sample Preservation and Integrity

All samples were pH 3 at the time of analysis.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Holding Times

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

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

The following DER was generated for this SDG: 1331102.

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA2.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890N/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL354598 GEL Work Order: 354598

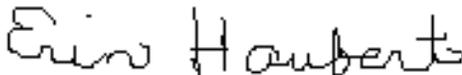
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: **Name:** Erin Haubert**Date:** 09 SEP 2014**Title:** Data Validator

Sample Data Summary

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 I14-035**

Report Date: September 9, 2014

Client Sample ID: B2X626
 Lab Sample ID: 354598006
 Matrix: WATER
 Collect Date: 11-AUG-14 11:12
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
<i>8260VOA_GCMS: COMMON + GW 01 "As Received"</i>												
1,1,1-Trichloroethane	U	2.00	0.300	2.00	5.00	ug/L	1	CDS1	08/20/14	15:30	1412995	1
1,1,2-Trichloroethane	U	2.00	0.300	2.00	5.00	ug/L	1					
1,1-Dichloroethane	U	2.00	0.300	2.00	10.0	ug/L	1					
1,1-Dichloroethylene	U	2.00	0.300	2.00	10.0	ug/L	1					
1,2-Dichloroethane	U	2.00	0.300	2.00	5.00	ug/L	1					
1,4-Dichlorobenzene	U	2.00	0.300	2.00	5.00	ug/L	1					
2-Butanone	TU	10.0	3.00	10.0	10.0	ug/L	1					
4-Methyl-2-pentanone	U	10.0	3.00	10.0	10.0	ug/L	1					
Acetone	TU	10.0	3.00	10.0	20.0	ug/L	1					
Benzene	U	2.00	0.300	2.00	5.00	ug/L	1					
Carbon disulfide	U	10.0	1.60	10.0	5.00	ug/L	1					
Carbon tetrachloride	U	2.00	0.300	2.00	5.00	ug/L	1					
Chlorobenzene	U	2.00	0.300	2.00	5.00	ug/L	1					
Chloroform	U	2.00	0.300	2.00	5.00	ug/L	1					
Ethylbenzene	U	2.00	0.300	2.00	5.00	ug/L	1					
Methylene chloride	U	5.00	1.60	5.00	5.00	ug/L	1					
Propionitrile	U	10.0	3.00	10.0	10.0	ug/L	1					
Tetrachloroethylene	U	2.00	0.300	2.00	5.00	ug/L	1					
Tetrahydrofuran	U	10.0	1.50	10.0	50.0	ug/L	1					
Toluene	U	2.00	0.300	2.00	5.00	ug/L	1					
Trichloroethene	J	3.53	0.300	2.00	5.00	ug/L	1					
Vinyl chloride	U	2.00	0.300	2.00	10.0	ug/L	1					
Xylenes (total)	U	6.00	0.300	6.00	10.0	ug/L	1					
cis-1,2-Dichloroethylene	U	2.00	0.300	2.00	5.00	ug/L	1					
n-Butyl alcohol	U	250	83.3	250	100	ug/L	1					
trans-1,2-Dichloroethylene	U	2.00	0.300	2.00	5.00	ug/L	1					

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260VOA_GCMS: COMMON + GW 01 "As	49.6 ug/L	50.0	99.2	(78%-124%)

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 I14-035**

Report Date: September 9, 2014

Client Sample ID: B2X626
 Lab Sample ID: 354598006

Project: HMSA00186
 Client ID: HMSA001

Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Surrogate/Tracer recovery	Test				Result	Nominal	Recovery%				Acceptable Limits	
Bromofluorobenzene	Received"											
	8260VOA_GCMS: COMMON + GW 01 "As				51.1 ug/L	50.0	102				(80%-120%)	
	Received"											
Toluene-d8	Received"											
	8260VOA_GCMS: COMMON + GW 01 "As				49.5 ug/L	50.0	98.9				(80%-120%)	
	Received"											

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 9, 2014

Page 1 of 10

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 354598

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
QC1203151938	LCS										
1,1,1-Trichloroethane	50.0			54.8	ug/L		110	(70%-130%)	CDS1	08/20/14	07:57
1,1,2-Trichloroethane	50.0			50.3	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0			53.1	ug/L		106	(70%-130%)			
1,1-Dichloroethylene	50.0			51.8	ug/L		104	(70%-130%)			
1,2-Dichloroethane	50.0			50.6	ug/L		101	(70%-130%)			
1,4-Dichlorobenzene	50.0			51.1	ug/L		102	(70%-130%)			
2-Butanone	250			259	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250			247	ug/L		98.7	(70%-130%)			
Acetone	250			281	ug/L		112	(70%-130%)			
Benzene	50.0			51.4	ug/L		103	(70%-130%)			
Carbon disulfide	250			265	ug/L		106	(70%-130%)			
Carbon tetrachloride	50.0			54.7	ug/L		109	(70%-130%)			
Chlorobenzene	50.0			51.5	ug/L		103	(70%-130%)			
Chloroform	50.0			52.2	ug/L		104	(70%-130%)			
Ethylbenzene	50.0			52.5	ug/L		105	(70%-130%)			
Methylene chloride	50.0			48.6	ug/L		97.2	(70%-130%)			
Tetrachloroethylene	50.0			53.9	ug/L		108	(70%-130%)			
Toluene	50.0			52.0	ug/L		104	(70%-130%)			
Trichloroethene	50.0			52.1	ug/L		104	(70%-130%)			
Vinyl chloride	50.0			55.0	ug/L		110	(70%-130%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 354598

Page 2 of 10

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
Xylenes (total)	150			158	ug/L		105	(70%-130%)	CDS1	08/20/14	07:57
cis-1,2-Dichloroethylene	50.0			51.5	ug/L		103	(70%-130%)			
n-Butyl alcohol	5000			5060	ug/L		101	(70%-130%)			
trans-1,2-Dichloroethylene	50.0			52.1	ug/L		104	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			49.0	ug/L		98.1	(78%-124%)			
**Bromofluorobenzene	50.0			48.3	ug/L		96.6	(80%-120%)			
**Toluene-d8	50.0			49.6	ug/L		99.3	(80%-120%)			
QC1203151939	LCS										
Propionitrile	250			254	ug/L		102	(70%-130%)		08/20/14	08:27
Tetrahydrofuran	250			251	ug/L		100	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			49.6	ug/L		99.2	(78%-124%)			
**Bromofluorobenzene	50.0			48.7	ug/L		97.4	(80%-120%)			
**Toluene-d8	50.0			49.3	ug/L		98.6	(80%-120%)			
QC1203151935	MB										
1,1,1-Trichloroethane			U	ND	ug/L					08/20/14	08:57
1,1,2-Trichloroethane			U	ND	ug/L						
1,1-Dichloroethane			U	ND	ug/L						
1,1-Dichloroethylene			U	ND	ug/L						
1,2-Dichloroethane			U	ND	ug/L						
1,4-Dichlorobenzene			U	ND	ug/L						
2-Butanone			U	ND	ug/L						
4-Methyl-2-pentanone			U	ND	ug/L						
Acetone			U	ND	ug/L						

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
Benzene			U	ND	ug/L				CDS1	08/20/14	08:57
Carbon disulfide			U	ND	ug/L						
Carbon tetrachloride			U	ND	ug/L						
Chlorobenzene			U	ND	ug/L						
Chloroform			U	ND	ug/L						
Ethylbenzene			U	ND	ug/L						
Methylene chloride			U	ND	ug/L						
Propionitrile			U	ND	ug/L						
Tetrachloroethylene			U	ND	ug/L						
Tetrahydrofuran			U	ND	ug/L						
Toluene			U	ND	ug/L						
Trichloroethene			U	ND	ug/L						
Vinyl chloride			U	ND	ug/L						
Xylenes (total)			U	ND	ug/L						
cis-1,2-Dichloroethylene			U	ND	ug/L						
n-Butyl alcohol			U	ND	ug/L						
trans-1,2-Dichloroethylene			U	ND	ug/L						
**1,2-Dichloroethane-d4	50.0			50.5	ug/L		101	(78%-124%)			
**Bromofluorobenzene	50.0			49.8	ug/L		99.5	(80%-120%)			
**Toluene-d8	50.0			50.0	ug/L		100	(80%-120%)			
QC1203151936 354598006 PS											
1,1,1-Trichloroethane	50.0	U	ND	51.9	ug/L		104	(70%-130%)		08/20/14	17:30

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
1,1,2-Trichloroethane	50.0	U	ND		49.8	ug/L	99.7	(70%-130%)	CDS1	08/20/14	17:30
1,1-Dichloroethane	50.0	U	ND		51.2	ug/L	102	(70%-130%)			
1,1-Dichloroethylene	50.0	U	ND		50.7	ug/L	101	(70%-130%)			
1,2-Dichloroethane	50.0	U	ND		49.7	ug/L	99.4	(70%-130%)			
1,4-Dichlorobenzene	50.0	U	ND		48.3	ug/L	96.6	(70%-130%)			
2-Butanone	250	TU	ND	T	163	ug/L	65.3 *	(70%-130%)			
4-Methyl-2-pentanone	250	U	ND		234	ug/L	93.7	(70%-130%)			
Acetone	250	TU	ND	T	141	ug/L	56.6 *	(70%-130%)			
Benzene	50.0	U	ND		50.3	ug/L	101	(70%-130%)			
Carbon disulfide	250	U	ND		261	ug/L	104	(70%-130%)			
Carbon tetrachloride	50.0	U	ND		52.6	ug/L	105	(70%-130%)			
Chlorobenzene	50.0	U	ND		49.2	ug/L	98.4	(70%-130%)			
Chloroform	50.0	U	ND		51.5	ug/L	103	(70%-130%)			
Ethylbenzene	50.0	U	ND		50.5	ug/L	101	(70%-130%)			
Methylene chloride	50.0	U	ND		48.4	ug/L	96.8	(70%-130%)			
Propionitrile		U	ND	U	ND	ug/L		(70%-130%)			
Tetrachloroethylene	50.0	U	ND		50.0	ug/L	100	(70%-130%)			
Tetrahydrofuran		U	ND	U	ND	ug/L		(70%-130%)			
Toluene	50.0	U	ND		49.9	ug/L	99.8	(70%-130%)			
Trichloroethene	50.0	J	3.53		53.2	ug/L	99.3	(70%-130%)			
Vinyl chloride	50.0	U	ND		60.0	ug/L	120	(70%-130%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
Xylenes (total)	150	U	ND		150	ug/L	100	(70%-130%)			
cis-1,2-Dichloroethylene	50.0	U	ND		50.9	ug/L	102	(70%-130%)	CDS1	08/20/14	17:30
n-Butyl alcohol	5000	U	ND		4980	ug/L	99.7	(70%-130%)			
trans-1,2-Dichloroethylene	50.0	U	ND		50.8	ug/L	102	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		49.6		49.4	ug/L	98.9	(78%-124%)			
**Bromofluorobenzene	50.0		51.1		49.7	ug/L	99.5	(80%-120%)			
**Toluene-d8	50.0		49.5		50.0	ug/L	99.9	(80%-120%)			
QC1203151960 354598006 PS											
1,1,1-Trichloroethane		U	ND	U	ND	ug/L		(70%-130%)		08/20/14	10:27
1,1,2-Trichloroethane		U	ND	U	ND	ug/L		(70%-130%)			
1,1-Dichloroethane		U	ND	U	ND	ug/L		(70%-130%)			
1,1-Dichloroethylene		U	ND	U	ND	ug/L		(70%-130%)			
1,2-Dichloroethane		U	ND	U	ND	ug/L		(70%-130%)			
1,4-Dichlorobenzene		U	ND	U	ND	ug/L		(70%-130%)			
2-Butanone		TU	ND	U	ND	ug/L		(70%-130%)			
4-Methyl-2-pentanone		U	ND	U	ND	ug/L		(70%-130%)			
Acetone		TU	ND	U	ND	ug/L		(70%-130%)			
Benzene		U	ND	U	ND	ug/L		(70%-130%)			
Carbon disulfide		U	ND	U	ND	ug/L		(70%-130%)			
Carbon tetrachloride		U	ND	U	ND	ug/L		(70%-130%)			
Chlorobenzene		U	ND	U	ND	ug/L		(70%-130%)			
Chloroform		U	ND	U	ND	ug/L		(70%-130%)			
Ethylbenzene		U	ND	U	ND	ug/L		(70%-130%)			

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
Methylene chloride		U	ND	U	ND	ug/L		(70%-130%)	CDS1	08/20/14	10:27
Propionitrile	250	U	ND		229	ug/L	91.7	(70%-130%)			
Tetrachloroethylene		U	ND	U	ND	ug/L		(70%-130%)			
Tetrahydrofuran	250	U	ND		220	ug/L	88	(70%-130%)			
Toluene		U	ND	U	ND	ug/L		(70%-130%)			
Trichloroethene		J	3.53	U	ND	ug/L		(70%-130%)			
Vinyl chloride		U	ND	U	ND	ug/L		(70%-130%)			
Xylenes (total)		U	ND	U	ND	ug/L		(70%-130%)			
cis-1,2-Dichloroethylene		U	ND	U	ND	ug/L		(70%-130%)			
n-Butyl alcohol		U	ND	U	ND	ug/L		(70%-130%)			
trans-1,2-Dichloroethylene		U	ND	U	ND	ug/L		(70%-130%)			
**1,2-Dichloroethane-d4	50.0		49.6		49.7	ug/L	99.4	(78%-124%)			
**Bromofluorobenzene	50.0		51.1		49.9	ug/L	99.8	(80%-120%)			
**Toluene-d8	50.0		49.5		49.4	ug/L	98.9	(80%-120%)			
QC1203151937 354598006 PSD											
1,1,1-Trichloroethane	50.0	U	ND		54.2	ug/L	4.45	108	(0%-20%)	08/20/14	18:00
1,1,2-Trichloroethane	50.0	U	ND		51.4	ug/L	3.08	103	(0%-20%)		
1,1-Dichloroethane	50.0	U	ND		53.2	ug/L	3.87	106	(0%-20%)		
1,1-Dichloroethylene	50.0	U	ND		52.8	ug/L	4.10	106	(0%-20%)		
1,2-Dichloroethane	50.0	U	ND		52.1	ug/L	4.70	104	(0%-20%)		
1,4-Dichlorobenzene	50.0	U	ND		50.1	ug/L	3.62	100	(0%-20%)		
2-Butanone	250	TU	ND	T	171	ug/L	4.50	68.3*	(0%-20%)		

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
4-Methyl-2-pentanone	250	U	ND		244	ug/L	3.92	97.4	(0%-20%)	CDS1	08/20/14 18:00
Acetone	250	TU	ND	T	147	ug/L	4.07	58.9*	(0%-20%)		
Benzene	50.0	U	ND		51.8	ug/L	2.80	104	(0%-20%)		
Carbon disulfide	250	U	ND		270	ug/L	3.49	108	(0%-20%)		
Carbon tetrachloride	50.0	U	ND		54.6	ug/L	3.71	109	(0%-20%)		
Chlorobenzene	50.0	U	ND		50.9	ug/L	3.32	102	(0%-20%)		
Chloroform	50.0	U	ND		53.4	ug/L	3.57	107	(0%-20%)		
Ethylbenzene	50.0	U	ND		52.3	ug/L	3.48	105	(0%-20%)		
Methylene chloride	50.0	U	ND		51.0	ug/L	5.21	102	(0%-20%)		
Propionitrile		U	ND	U	ND	ug/L	N/A		(0%-20%)		
Tetrachloroethylene	50.0	U	ND		51.5	ug/L	2.92	103	(0%-20%)		
Tetrahydrofuran		U	ND	U	ND	ug/L	N/A		(0%-20%)		
Toluene	50.0	U	ND		51.1	ug/L	2.41	102	(0%-20%)		
Trichloroethene	50.0	J	3.53		55.2	ug/L	3.71	103	(0%-20%)		
Vinyl chloride	50.0	U	ND		58.6	ug/L	2.31	117	(0%-20%)		
Xylenes (total)	150	U	ND		156	ug/L	3.73	104	(0%-20%)		
cis-1,2-Dichloroethylene	50.0	U	ND		52.2	ug/L	2.54	104	(0%-20%)		
n-Butyl alcohol	5000	U	ND		5260	ug/L	5.35	105	(0%-20%)		
trans-1,2-Dichloroethylene	50.0	U	ND		52.6	ug/L	3.52	105	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		49.6		49.7	ug/L		99.4	(78%-124%)		
**Bromofluorobenzene	50.0		51.1		49.6	ug/L		99.1	(80%-120%)		

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
**Toluene-d8	50.0	49.5		49.2	ug/L		98.5	(80%-120%)			
QC1203151961 354598006 PSD											
1,1,1-Trichloroethane	U	ND	U	ND	ug/L	N/A		(0%-20%)	CDS1	08/20/14	10:57
1,1,2-Trichloroethane	U	ND	U	ND	ug/L	N/A		(0%-20%)			
1,1-Dichloroethane	U	ND	U	ND	ug/L	N/A		(0%-20%)			
1,1-Dichloroethylene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
1,2-Dichloroethane	U	ND	U	ND	ug/L	N/A		(0%-20%)			
1,4-Dichlorobenzene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
2-Butanone	TU	ND	U	ND	ug/L	N/A		(0%-20%)			
4-Methyl-2-pentanone	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Acetone	TU	ND	U	ND	ug/L	N/A		(0%-20%)			
Benzene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Carbon disulfide	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Carbon tetrachloride	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Chlorobenzene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Chloroform	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Ethylbenzene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Methylene chloride	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Propionitrile	250	U	ND	229	ug/L	0.0611	91.7	(0%-20%)			
Tetrachloroethylene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Tetrahydrofuran	250	U	ND	219	ug/L	0.593	87.4	(0%-20%)			
Toluene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
Trichloroethene	J	3.53	U	ND	ug/L	N/A		(0%-20%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1412995										
Vinyl chloride	U	ND	U	ND	ug/L	N/A		(0%-20%)	CDS1	08/20/14	10:57
Xylenes (total)	U	ND	U	ND	ug/L	N/A		(0%-20%)			
cis-1,2-Dichloroethylene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
n-Butyl alcohol	U	ND	U	ND	ug/L	N/A		(0%-20%)			
trans-1,2-Dichloroethylene	U	ND	U	ND	ug/L	N/A		(0%-20%)			
**1,2-Dichloroethane-d4	50.0	49.6		48.8	ug/L		97.6	(78%-124%)			
**Bromofluorobenzene	50.0	51.1		48.9	ug/L		97.8	(80%-120%)			
**Toluene-d8	50.0	49.5		48.9	ug/L		97.8	(80%-120%)			

Notes:

The Qualifiers in this report are defined as follows:

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

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QC Summary

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

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

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 05-SEP-14	Division: Federal	Quality Criteria: SOP	Type: Process
Instrument Type: VOA GC/MS	Test / Method: 8260C	Matrix Type: Liquid	Client Code: HMSA001
Batch ID: 1412995	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 354598(GEL354598),354618(GEL354618),354792(GEL354792),355130(GEL355130),355134(GEL355134),355243(GEL355243),355329(GEL355329),355330(GEL355330)</p> <p>Application Issues:</p> <p>Failed Recovery for MSD/PSD Failed Recovery for MS/PS</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. The recoveries for Acetone and 2-Butanone were outside of acceptance limits in the MS and in the MSD performed on sample 354598006.</p> <p>In the MS: 2-Butanone recovered at 65%. The limits are 70%-130%. Acetone recovered at 57%. The limits are 70%-130%.</p> <p>In the MSD: 2-Butanone recovered at 68%. Acetone recovered at 59%.</p>		<p>1. Narrate and report data. The calculated relative percent differences between the MS and MSD were within acceptance limits for both compounds. The MS and MSD displayed similar recoveries.</p>	

Originator's Name:
Crystal Stacey 05-SEP-14

Data Validator/Group Leader:
Erin Haubert 09-SEP-14

Metals Analysis

Case Narrative

**Metals Fractional Narrative
Hanford MSA (HMSA)
SDG GEL354598**

Sample Analysis

Sample ID	Client ID
354598001	B2X607
354598002	B2X601
354598005	B2X630
354598006	B2X626
354598008	B2X6H6
354598009	B2X6H0
354598010	B2X6H7
354598011	B2X6H1
1203147424	Method Blank (MB) ICP
1203147425	Laboratory Control Sample (LCS)
1203147428	354598008(B2X6H6L) Serial Dilution (SD)
1203147426	354598008(B2X6H6S) Matrix Spike (MS)
1203147427	354598008(B2X6H6SD) Matrix Spike Duplicate (MSD)
1203147379	Method Blank (MB) ICP-MS
1203147380	Laboratory Control Sample (LCS)
1203147383	354598001(B2X607L) Serial Dilution (SD)
1203147381	354598001(B2X607S) Matrix Spike (MS)
1203147382	354598001(B2X607SD) Matrix Spike Duplicate (MSD)

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

Method/Analysis Information

Analytical Batch:	1411249 and 1411225
Prep Batch :	1411248 and 1411223
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 11 and GL-MA-E-014 REV# 25

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. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X 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. Operating conditions are set at 1600W power, 16 L/m for the plasma, and 1.2 L/m auxiliary gases, and 1.12 L/min carrier gas flow.

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

All PQL standards for 6010C met the control limits with the exception of antimony, potassium, calcium, sodium and uranium listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected. 354598008 (B2X6H6), 354598009 (B2X6H0), 354598010 (B2X6H7) and 354598011 (B2X6H1)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB 1203147424 (MB)-ICP analyzed with this SDG met the acceptance criteria. In instances where there

were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. The MB 1203147379 (MB)-ICP-MS analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

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: 354598008 (B2X6H6)-ICP and 354598001 (B2X607)-ICP-MS.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

Matrix Spike Duplicate (MSD) Recovery Statement

The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable analytes met the acceptance criteria.

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

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Strontium did not meet the established percent difference criteria. 1203147383 (B2X607)-ICP-MS.

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. 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

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were prepared exactly 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

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

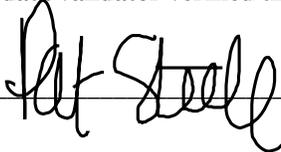
Certification Statement

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.

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: 10/03/2014

Sample Data Summary

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL354598 GEL Work Order: 354598

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

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

D Results are reported from a diluted aliquot of sample.

E Reported value is estimated due to interferences. See comment in narrative.

M Duplicate precision not met.

N Spike Sample recovery is outside control limits.

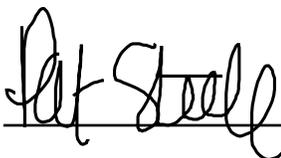
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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



10/03/2014

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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X607
 Lab Sample ID: 354598001
 Matrix: WATER
 Collect Date: 12-AUG-14 09:01
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum	U	15.0	15.0	50.0	50.0	ug/L	1	SKJ	09/03/14	01:23	1411225	1
Barium		32.7	0.600	2.00	2.00	ug/L	1					
Beryllium	U	0.200	0.200	0.500	0.500	ug/L	1					
Cadmium	U	0.110	0.110	1.00	1.00	ug/L	1					
Chromium	B	2.27	2.00	10.0	10.0	ug/L	1					
Cobalt	B	0.219	0.100	1.00	1.00	ug/L	1					
Copper	B	0.705	0.350	1.00	1.00	ug/L	1					
Lead	U	0.500	0.500	2.00	2.00	ug/L	1					
Manganese	U	1.00	1.00	5.00	5.00	ug/L	1					
Nickel	B	1.01	0.500	2.00	2.00	ug/L	1					
Silver	U	0.200	0.200	1.00	1.00	ug/L	1					
Strontium	M	259	2.00	10.0	10.0	ug/L	1					
Thallium	U	0.450	0.450	2.00	2.00	ug/L	1					
Thorium	U	0.383	0.383	2.00	2.00	ug/L	1					
Tin	U	1.00	1.00	5.00	5.00	ug/L	1					
Uranium		2.94	0.067	0.200	0.200	ug/L	1					
Zinc	B	3.67	3.50	10.0	10.0	ug/L	1					
Molybdenum	C	3.61	0.165	0.500	0.500	ug/L	1	SKJ	09/03/14	19:06	1411225	2
Boron	B	9.70	4.00	15.0	15.0	ug/L	1	SKJ	09/05/14	08:40	1411225	3
Arsenic	U	1.70	1.70	5.00	5.00	ug/L	1	BAJ	09/08/14	13:49	1411225	4
Selenium	U	1.50	1.50	5.00	5.00	ug/L	1					
Antimony	U	1.00	1.00	3.00	3.00	ug/L	1	PRB	09/09/14	00:47	1411225	5

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXO1	08/13/14	1615	1411223

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6020_METALS_ICPMS	
2	6020_METALS_ICPMS	
3	6020_METALS_ICPMS	
4	6020_METALS_ICPMS	

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X607
Lab Sample ID: 354598001

Project: HMSA00186
Client ID: HMSA001
Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
5		6020_METALS_ICPMS										

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X601
 Lab Sample ID: 354598002
 Matrix: WATER
 Collect Date: 12-AUG-14 09:01
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum		50.2	15.0	50.0	50.0	ug/L	1	SKJ	09/03/14	02:11	1411225	1
Barium		32.4	0.600	2.00	2.00	ug/L	1					
Beryllium	U	0.200	0.200	0.500	0.500	ug/L	1					
Cadmium	U	0.110	0.110	1.00	1.00	ug/L	1					
Chromium	B	3.66	2.00	10.0	10.0	ug/L	1					
Cobalt	B	0.189	0.100	1.00	1.00	ug/L	1					
Copper		1.19	0.350	1.00	1.00	ug/L	1					
Lead	U	0.500	0.500	2.00	2.00	ug/L	1					
Manganese		11.5	1.00	5.00	5.00	ug/L	1					
Nickel	B	1.54	0.500	2.00	2.00	ug/L	1					
Silver	U	0.200	0.200	1.00	1.00	ug/L	1					
Strontium	M	261	2.00	10.0	10.0	ug/L	1					
Thallium	U	0.450	0.450	2.00	2.00	ug/L	1					
Thorium	U	0.383	0.383	2.00	2.00	ug/L	1					
Tin	U	1.00	1.00	5.00	5.00	ug/L	1					
Uranium		3.15	0.067	0.200	0.200	ug/L	1					
Zinc	B	6.89	3.50	10.0	10.0	ug/L	1					
Molybdenum	C	3.35	0.165	0.500	0.500	ug/L	1	SKJ	09/03/14	19:48	1411225	2
Boron	B	9.41	4.00	15.0	15.0	ug/L	1	SKJ	09/05/14	09:19	1411225	3
Arsenic	B	2.56	1.70	5.00	5.00	ug/L	1	BAJ	09/08/14	14:13	1411225	4
Selenium	U	1.50	1.50	5.00	5.00	ug/L	1					
Antimony	U	1.00	1.00	3.00	3.00	ug/L	1	PRB	09/09/14	01:00	1411225	5

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXO1	08/13/14	1615	1411223

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6020_METALS_ICPMS	
2	6020_METALS_ICPMS	
3	6020_METALS_ICPMS	
4	6020_METALS_ICPMS	

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Certificate of Analysis

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Contact: Mr. Scot Fitzgerald
Project: **CHPRC SAF I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X601
Lab Sample ID: 354598002

Project: HMSA00186
Client ID: HMSA001
Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
5	6020_METALS_ICPMS											

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X630
 Lab Sample ID: 354598005
 Matrix: WATER
 Collect Date: 11-AUG-14 11:12
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum	U	15.0	15.0	50.0	50.0	ug/L	1	SKJ	09/03/14	02:18	1411225	1
Barium		47.5	0.600	2.00	2.00	ug/L	1					
Beryllium	U	0.200	0.200	0.500	0.500	ug/L	1					
Cadmium	U	0.110	0.110	1.00	1.00	ug/L	1					
Chromium		11.1	2.00	10.0	10.0	ug/L	1					
Cobalt	B	0.211	0.100	1.00	1.00	ug/L	1					
Copper	B	0.591	0.350	1.00	1.00	ug/L	1					
Lead	U	0.500	0.500	2.00	2.00	ug/L	1					
Manganese	U	1.00	1.00	5.00	5.00	ug/L	1					
Nickel	B	0.866	0.500	2.00	2.00	ug/L	1					
Silver	U	0.200	0.200	1.00	1.00	ug/L	1					
Strontium	M	219	2.00	10.0	10.0	ug/L	1					
Thallium	U	0.450	0.450	2.00	2.00	ug/L	1					
Thorium	U	0.383	0.383	2.00	2.00	ug/L	1					
Tin	U	1.00	1.00	5.00	5.00	ug/L	1					
Uranium		1.75	0.067	0.200	0.200	ug/L	1					
Zinc	U	3.50	3.50	10.0	10.0	ug/L	1					
Molybdenum	C	1.34	0.165	0.500	0.500	ug/L	1	SKJ	09/03/14	19:54	1411225	2
Boron	B	12.6	4.00	15.0	15.0	ug/L	1	SKJ	09/05/14	09:25	1411225	3
Arsenic	U	1.70	1.70	5.00	5.00	ug/L	1	BAJ	09/08/14	14:16	1411225	4
Selenium	U	1.50	1.50	5.00	5.00	ug/L	1					
Antimony	U	1.00	1.00	3.00	3.00	ug/L	1	PRB	09/09/14	01:03	1411225	5

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXO1	08/13/14	1615	1411223

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6020_METALS_ICPMS	
2	6020_METALS_ICPMS	
3	6020_METALS_ICPMS	
4	6020_METALS_ICPMS	

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Certificate of Analysis

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 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X630
 Lab Sample ID: 354598005

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
5	6020_METALS_ICPMS											

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X626
 Lab Sample ID: 354598006
 Matrix: WATER
 Collect Date: 11-AUG-14 11:12
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: GW 01 "As Received"</i>												
Aluminum	U	15.0	15.0	50.0	50.0	ug/L	1	SKJ	09/03/14	02:25	1411225	1
Barium		47.5	0.600	2.00	2.00	ug/L	1					
Beryllium	U	0.200	0.200	0.500	0.500	ug/L	1					
Cadmium	U	0.110	0.110	1.00	1.00	ug/L	1					
Chromium		10.6	2.00	10.0	10.0	ug/L	1					
Cobalt	U	0.100	0.100	1.00	1.00	ug/L	1					
Copper	B	0.648	0.350	1.00	1.00	ug/L	1					
Lead	U	0.500	0.500	2.00	2.00	ug/L	1					
Manganese	U	1.00	1.00	5.00	5.00	ug/L	1					
Nickel	B	0.908	0.500	2.00	2.00	ug/L	1					
Silver	U	0.200	0.200	1.00	1.00	ug/L	1					
Strontium	M	220	2.00	10.0	10.0	ug/L	1					
Thallium	U	0.450	0.450	2.00	2.00	ug/L	1					
Thorium	U	0.383	0.383	2.00	2.00	ug/L	1					
Tin	U	1.00	1.00	5.00	5.00	ug/L	1					
Uranium		1.72	0.067	0.200	0.200	ug/L	1					
Zinc	U	3.50	3.50	10.0	10.0	ug/L	1					
Molybdenum	C	1.32	0.165	0.500	0.500	ug/L	1	SKJ	09/03/14	20:00	1411225	2
Boron	B	12.7	4.00	15.0	15.0	ug/L	1	SKJ	09/05/14	09:31	1411225	3
Arsenic	U	1.70	1.70	5.00	5.00	ug/L	1	BAJ	09/08/14	14:19	1411225	4
Selenium	U	1.50	1.50	5.00	5.00	ug/L	1					
Antimony	U	1.00	1.00	3.00	3.00	ug/L	1	PRB	09/09/14	01:05	1411225	5

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXO1	08/13/14	1615	1411223

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6020_METALS_ICPMS	
2	6020_METALS_ICPMS	
3	6020_METALS_ICPMS	
4	6020_METALS_ICPMS	

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X626
Lab Sample ID: 354598006

Project: HMSA00186
Client ID: HMSA001

Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
5	6020_METALS_ICPMS											

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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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X6H6
 Lab Sample ID: 354598008
 Matrix: WATER
 Collect Date: 11-AUG-14 10:00
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON + GW 03 "As Received"</i>												
Antimony	U	3.50	3.50	10.0	10.0	ug/L	1	HSC	08/18/14	19:19	1411249	1
Arsenic	U	5.00	5.00	30.0	30.0	ug/L	1					
Barium		33.0	1.00	5.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	5.00	ug/L	1					
Chromium		11.8	1.00	5.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	10.0	ug/L	1					
Iron	U	30.0	30.0	100	100	ug/L	1					
Manganese	U	2.00	2.00	10.0	10.0	ug/L	1					
Nickel	U	1.50	1.50	5.00	5.00	ug/L	1					
Potassium		2270	50.0	150	150	ug/L	1					
Silver	U	1.00	1.00	5.00	5.00	ug/L	1					
Vanadium	U	1.00	1.00	5.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	10.0	ug/L	1					
Calcium		62900	50.0	200	200	ug/L	1	HSC	09/04/14	07:22	1411249	2
Magnesium		9350	110	300	300	ug/L	1					
Sodium		8250	100	300	300	ug/L	1					
Strontium		308	1.00	5.00	5.00	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JX01	08/13/14	1615	1411248

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X6H0
 Lab Sample ID: 354598009
 Matrix: WATER
 Collect Date: 11-AUG-14 10:00
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON + GW 03 "As Received"</i>												
Antimony	U	3.50	3.50	10.0	10.0	ug/L	1	HSC	08/18/14	19:47	1411249	1
Arsenic	U	5.00	5.00	30.0	30.0	ug/L	1					
Barium		32.3	1.00	5.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	5.00	ug/L	1					
Calcium		60600	50.0	200	200	ug/L	1					
Chromium		14.7	1.00	5.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	10.0	ug/L	1					
Iron	B	31.8	30.0	100	100	ug/L	1					
Magnesium		9230	110	300	300	ug/L	1					
Manganese	U	2.00	2.00	10.0	10.0	ug/L	1					
Nickel	B	1.62	1.50	5.00	5.00	ug/L	1					
Potassium		2260	50.0	150	150	ug/L	1					
Silver	U	1.00	1.00	5.00	5.00	ug/L	1					
Sodium		8960	100	300	300	ug/L	1					
Strontium		306	1.00	5.00	5.00	ug/L	1					
Vanadium	U	1.00	1.00	5.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	10.0	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXO1	08/13/14	1615	1411248

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	

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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X6H7
 Lab Sample ID: 354598010
 Matrix: WATER
 Collect Date: 11-AUG-14 10:00
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON + GW 03 "As Received"</i>												
Antimony	U	3.50	3.50	10.0	10.0	ug/L	1	HSC	08/18/14	19:50	1411249	1
Arsenic	BC	6.50	5.00	30.0	30.0	ug/L	1					
Barium		33.0	1.00	5.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	5.00	ug/L	1					
Calcium		61600	50.0	200	200	ug/L	1					
Chromium		11.2	1.00	5.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	10.0	ug/L	1					
Iron	U	30.0	30.0	100	100	ug/L	1					
Magnesium		9240	110	300	300	ug/L	1					
Manganese	U	2.00	2.00	10.0	10.0	ug/L	1					
Nickel	U	1.50	1.50	5.00	5.00	ug/L	1					
Potassium		2260	50.0	150	150	ug/L	1					
Silver	U	1.00	1.00	5.00	5.00	ug/L	1					
Sodium		8910	100	300	300	ug/L	1					
Strontium		311	1.00	5.00	5.00	ug/L	1					
Vanadium	U	1.00	1.00	5.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	10.0	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXO1	08/13/14	1615	1411248

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	

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 I14-035**

Report Date: October 3, 2014

Client Sample ID: B2X6H1
 Lab Sample ID: 354598011
 Matrix: WATER
 Collect Date: 11-AUG-14 10:00
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON + GW 03 "As Received"</i>												
Antimony	U	3.50	3.50	10.0	10.0	ug/L	1	HSC	08/18/14	19:53	1411249	1
Arsenic	BC	8.36	5.00	30.0	30.0	ug/L	1					
Barium		32.5	1.00	5.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	5.00	ug/L	1					
Calcium		61100	50.0	200	200	ug/L	1					
Chromium		14.8	1.00	5.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	10.0	ug/L	1					
Iron	U	30.0	30.0	100	100	ug/L	1					
Magnesium		9120	110	300	300	ug/L	1					
Manganese	U	2.00	2.00	10.0	10.0	ug/L	1					
Nickel	B	2.27	1.50	5.00	5.00	ug/L	1					
Potassium		2230	50.0	150	150	ug/L	1					
Silver	U	1.00	1.00	5.00	5.00	ug/L	1					
Sodium		8860	100	300	300	ug/L	1					
Strontium		308	1.00	5.00	5.00	ug/L	1					
Vanadium	B	1.17	1.00	5.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	10.0	ug/L	1					

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXO1	08/13/14	1615	1411248

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: October 3, 2014

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 354598

Parmname	NOM	Sample Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS										
Batch	1411225									
QC1203147380	LCS									
Aluminum	2000		2150	ug/L		108	(80%-120%)	SKJ	09/03/14	01:03
Antimony	50.0		53.2	ug/L		106	(80%-120%)	PRB	09/09/14	00:45
Arsenic	50.0		50.7	ug/L		101	(80%-120%)	BAJ	09/08/14	13:40
Barium	50.0		52.2	ug/L		104	(80%-120%)	SKJ	09/03/14	01:03
Beryllium	50.0		57.8	ug/L		116	(80%-120%)			
Boron	100		90.3	ug/L		90.3	(80%-120%)		09/05/14	08:23
Cadmium	50.0		53.1	ug/L		106	(80%-120%)		09/03/14	01:03
Chromium	50.0		57.0	ug/L		114	(80%-120%)			
Cobalt	50.0		55.3	ug/L		111	(80%-120%)			
Copper	50.0		56.6	ug/L		113	(80%-120%)			
Lead	50.0		55.7	ug/L		111	(80%-120%)			
Manganese	50.0		55.8	ug/L		112	(80%-120%)			
Molybdenum	50.0		53.7	ug/L		107	(80%-120%)		09/03/14	18:49
Nickel	50.0		56.8	ug/L		114	(80%-120%)		09/03/14	01:03
Selenium	50.0		54.6	ug/L		109	(80%-120%)	BAJ	09/08/14	13:40
Silver	50.0		56.8	ug/L		114	(80%-120%)	SKJ	09/03/14	01:03
Strontium	50.0		54.7	ug/L		109	(80%-120%)			
Thallium	50.0		51.6	ug/L		103	(80%-120%)			
Thorium	50.0		55.9	ug/L		112	(80%-120%)			
Tin	50.0		53.7	ug/L		107	(80%-120%)			

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1411225										
Uranium	50.0			56.7	ug/L		113	(80%-120%)	SKJ	09/03/14	01:03
Zinc	50.0			53.8	ug/L		108	(80%-120%)			
QC1203147379	MB										
Aluminum			U	ND	ug/L					09/03/14	00:56
Antimony			U	ND	ug/L				PRB	09/09/14	00:42
Arsenic			U	ND	ug/L				BAJ	09/08/14	13:37
Barium			U	ND	ug/L				SKJ	09/03/14	00:56
Beryllium			U	ND	ug/L						
Boron			U	ND	ug/L					09/05/14	08:17
Cadmium			U	ND	ug/L					09/03/14	00:56
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Lead			U	ND	ug/L						
Manganese			U	ND	ug/L						
Molybdenum			B	0.204	ug/L					09/03/14	18:43
Nickel			U	ND	ug/L					09/03/14	00:56
Selenium			U	ND	ug/L				BAJ	09/08/14	13:37
Silver			U	ND	ug/L				SKJ	09/03/14	00:56
Strontium			U	ND	ug/L						
Thallium			U	ND	ug/L						
Thorium			U	ND	ug/L						

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1411225										
Tin			U	ND	ug/L				SKJ	09/03/14	00:56
Uranium			U	ND	ug/L						
Zinc			U	ND	ug/L						
QC1203147381	354598001 MS										
Aluminum	2000	U	ND	1970	ug/L		98.4	(75%-125%)		09/03/14	01:30
Antimony	50.0	U	ND	54.2	ug/L		108	(75%-125%)	PRB	09/09/14	00:50
Arsenic	50.0	U	ND	54.7	ug/L		108	(75%-125%)	BAJ	09/08/14	13:52
Barium	50.0		32.7	79.3	ug/L		93.3	(75%-125%)	SKJ	09/03/14	01:30
Beryllium	50.0	U	ND	55.3	ug/L		111	(75%-125%)			
Boron	100	B	9.70	97.0	ug/L		87.3	(75%-125%)		09/05/14	08:45
Cadmium	50.0	U	ND	53.1	ug/L		106	(75%-125%)		09/03/14	01:30
Chromium	50.0	B	2.27	54.7	ug/L		105	(75%-125%)			
Cobalt	50.0	B	0.219	51.4	ug/L		102	(75%-125%)			
Copper	50.0	B	0.705	52.2	ug/L		103	(75%-125%)			
Lead	50.0	U	ND	53.5	ug/L		107	(75%-125%)			
Manganese	50.0	U	ND	52.3	ug/L		103	(75%-125%)			
Molybdenum	50.0	C	3.61	57.5	ug/L		108	(75%-125%)		09/03/14	19:12
Nickel	50.0	B	1.01	52.4	ug/L		103	(75%-125%)		09/03/14	01:30
Selenium	50.0	U	ND	55.4	ug/L		109	(75%-125%)	BAJ	09/08/14	13:52
Silver	50.0	U	ND	54.3	ug/L		109	(75%-125%)	SKJ	09/03/14	01:30
Strontium	50.0	M	259	311	ug/L		N/A	(75%-125%)			
Thallium	50.0	U	ND	49.4	ug/L		98.6	(75%-125%)			

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1411225										
Thorium	50.0	U	ND	56.0	ug/L		111	(75%-125%)	SKJ	09/03/14	01:30
Tin	50.0	U	ND	54.8	ug/L		110	(75%-125%)			
Uranium	50.0		2.94	59.8	ug/L		114	(75%-125%)			
Zinc	50.0	B	3.67	55.2	ug/L		103	(75%-125%)			
QC1203147382	354598001 MSD										
Aluminum	2000	U	ND	2070	ug/L	4.74	103	(0%-20%)		09/03/14	01:37
Antimony	50.0	U	ND	54.9	ug/L	1.27	109	(0%-20%)	PRB	09/09/14	00:52
Arsenic	50.0	U	ND	56.2	ug/L	2.72	111	(0%-20%)	BAJ	09/08/14	13:55
Barium	50.0		32.7	78.5	ug/L	0.963	91.7	(0%-20%)	SKJ	09/03/14	01:37
Beryllium	50.0	U	ND	58.9	ug/L	6.31	118	(0%-20%)			
Boron	100	B	9.70	100	ug/L	3.21	90.5	(0%-20%)		09/05/14	08:51
Cadmium	50.0	U	ND	54.2	ug/L	2.04	108	(0%-20%)		09/03/14	01:37
Chromium	50.0	B	2.27	58.4	ug/L	6.54	112	(0%-20%)			
Cobalt	50.0	B	0.219	53.8	ug/L	4.57	107	(0%-20%)			
Copper	50.0	B	0.705	54.4	ug/L	4.03	107	(0%-20%)			
Lead	50.0	U	ND	55.1	ug/L	2.92	110	(0%-20%)			
Manganese	50.0	U	ND	55.0	ug/L	5.17	109	(0%-20%)			
Molybdenum	50.0	C	3.61	60.4	ug/L	4.93	114	(0%-20%)		09/03/14	19:18
Nickel	50.0	B	1.01	54.7	ug/L	4.33	107	(0%-20%)		09/03/14	01:37
Selenium	50.0	U	ND	57.6	ug/L	3.83	113	(0%-20%)	BAJ	09/08/14	13:55
Silver	50.0	U	ND	55.7	ug/L	2.53	111	(0%-20%)	SKJ	09/03/14	01:37
Strontium	50.0	M	259	330	ug/L	5.68	N/A	(0%-20%)			

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1411225										
Thallium	50.0	U	ND	51.9	ug/L	4.84	104	(0%-20%)	SKJ	09/03/14	01:37
Thorium	50.0	U	ND	58.1	ug/L	3.74	116	(0%-20%)			
Tin	50.0	U	ND	55.1	ug/L	0.597	110	(0%-20%)			
Uranium	50.0		2.94	62.4	ug/L	4.25	119	(0%-20%)			
Zinc	50.0	B	3.67	57.1	ug/L	3.43	107	(0%-20%)			
QC1203147383 354598001 SDILT											
Aluminum		U	ND DU	ND	ug/L	N/A		(0%-10%)		09/03/14	01:51
Antimony		U	ND U	ND	ug/L	N/A		(0%-10%)	PRB	09/09/14	00:58
Arsenic		U	ND DU	ND	ug/L	N/A		(0%-10%)	BAJ	09/08/14	14:01
Barium			32.7 D	6.61	ug/L	1.18		(0%-10%)	SKJ	09/03/14	01:51
Beryllium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Boron		B	9.70 D	5.22	ug/L	169		(0%-10%)		09/05/14	09:02
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)		09/03/14	01:51
Chromium		B	2.27 DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		B	0.219 DU	ND	ug/L	N/A		(0%-10%)			
Copper		B	0.705 DU	ND	ug/L	N/A		(0%-10%)			
Lead		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Manganese		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Molybdenum		C	3.61 D	0.751	ug/L	4.13		(0%-10%)		09/03/14	19:30
Nickel		B	1.01 DU	ND	ug/L	N/A		(0%-10%)		09/03/14	01:51
Selenium		U	ND DU	ND	ug/L	N/A		(0%-10%)	BAJ	09/08/14	14:01
Silver		U	ND DU	ND	ug/L	N/A		(0%-10%)	SKJ	09/03/14	01:51

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1411225										
Strontium	M	259	DM	57.2	ug/L	10.6*		(0%-10%)	SKJ	09/03/14	01:51
Thallium	U	ND	D	0.684	ug/L	N/A		(0%-10%)			
Thorium	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Tin	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Uranium		2.94	D	0.612	ug/L	4.22		(0%-10%)			
Zinc	B	3.67	DU	ND	ug/L	N/A		(0%-10%)			
Metals Analysis-ICP											
Batch	1411249										
QC1203147425	LCS										
Antimony	500			512	ug/L		102	(80%-120%)	HSC	08/18/14	19:15
Arsenic	500			464	ug/L		92.9	(80%-120%)			
Barium	500			475	ug/L		95	(80%-120%)			
Beryllium	500			477	ug/L		95.3	(80%-120%)			
Cadmium	500			470	ug/L		94	(80%-120%)			
Calcium	5000			4610	ug/L		92.2	(80%-120%)			
Chromium	500			529	ug/L		106	(80%-120%)			
Cobalt	500			476	ug/L		95.1	(80%-120%)			
Copper	500			519	ug/L		104	(80%-120%)			
Iron	5000			4810	ug/L		96.2	(80%-120%)			
Magnesium	5000			4810	ug/L		96.3	(80%-120%)			
Manganese	500			535	ug/L		107	(80%-120%)			
Nickel	500			524	ug/L		105	(80%-120%)			
Potassium	5000			4820	ug/L		96.5	(80%-120%)			

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1411249										
Silver	500			445	ug/L		89	(80%-120%)	HSC	08/18/14	19:15
Sodium	5000			5170	ug/L		103	(80%-120%)			
Strontium	500			479	ug/L		95.9	(80%-120%)			
Vanadium	500			546	ug/L		109	(80%-120%)			
Zinc	500			532	ug/L		106	(80%-120%)			
QC1203147424	MB										
Antimony			U	ND	ug/L					08/18/14	19:11
Arsenic			B	5.43	ug/L						
Barium			U	ND	ug/L						
Beryllium			U	ND	ug/L						
Cadmium			U	ND	ug/L						
Calcium			U	ND	ug/L						
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Manganese			U	ND	ug/L						
Nickel			U	ND	ug/L						
Potassium			U	ND	ug/L						
Silver			U	ND	ug/L						
Sodium			U	ND	ug/L						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1411249										
Strontium			U	ND	ug/L				HSC	08/18/14	19:11
Vanadium			U	ND	ug/L						
Zinc			U	ND	ug/L						
QC1203147426 354598008 MS											
Antimony	500	U	ND	521	ug/L		104	(75%-125%)		08/18/14	19:22
Arsenic	500	U	ND	476	ug/L		95.2	(75%-125%)			
Barium	500		33.0	495	ug/L		92.4	(75%-125%)			
Beryllium	500	U	ND	472	ug/L		94.4	(75%-125%)			
Cadmium	500	U	ND	455	ug/L		91	(75%-125%)			
Calcium	5000		62900	67300	ug/L		N/A	(75%-125%)		09/04/14	07:25
Chromium	500		11.8	528	ug/L		103	(75%-125%)		08/18/14	19:22
Cobalt	500	U	ND	447	ug/L		89.4	(75%-125%)			
Copper	500	U	ND	510	ug/L		102	(75%-125%)			
Iron	5000	U	ND	4810	ug/L		95.8	(75%-125%)			
Magnesium	5000		9350	13900	ug/L		90.8	(75%-125%)		09/04/14	07:25
Manganese	500	U	ND	518	ug/L		104	(75%-125%)		08/18/14	19:22
Nickel	500	U	ND	487	ug/L		97.1	(75%-125%)			
Potassium	5000		2270	7070	ug/L		95.9	(75%-125%)			
Silver	500	U	ND	441	ug/L		88.1	(75%-125%)			
Sodium	5000		8250	12600	ug/L		86.2	(75%-125%)		09/04/14	07:25
Strontium	500		308	759	ug/L		90.3	(75%-125%)			
Vanadium	500	U	ND	546	ug/L		109	(75%-125%)		08/18/14	19:22

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1411249										
Zinc	500	U	ND	513	ug/L		103	(75%-125%)	HSC	08/18/14	19:22
QC1203147427 354598008 MSD											
Antimony	500	U	ND	525	ug/L	0.861	105	(0%-20%)		08/18/14	19:25
Arsenic	500	U	ND	486	ug/L	2.05	97.1	(0%-20%)			
Barium	500		33.0	508	ug/L	2.65	95.1	(0%-20%)			
Beryllium	500	U	ND	482	ug/L	2.11	96.4	(0%-20%)			
Cadmium	500	U	ND	468	ug/L	2.77	93.6	(0%-20%)			
Calcium	5000		62900	67600	ug/L	0.372	N/A	(0%-20%)		09/04/14	07:28
Chromium	500		11.8	536	ug/L	1.53	105	(0%-20%)		08/18/14	19:25
Cobalt	500	U	ND	460	ug/L	2.99	92.1	(0%-20%)			
Copper	500	U	ND	517	ug/L	1.39	103	(0%-20%)			
Iron	5000	U	ND	4840	ug/L	0.808	96.6	(0%-20%)			
Magnesium	5000		9350	14000	ug/L	1.07	93.8	(0%-20%)		09/04/14	07:28
Manganese	500	U	ND	521	ug/L	0.728	104	(0%-20%)		08/18/14	19:25
Nickel	500	U	ND	493	ug/L	1.28	98.4	(0%-20%)			
Potassium	5000		2270	7090	ug/L	0.342	96.4	(0%-20%)			
Silver	500	U	ND	453	ug/L	2.77	90.6	(0%-20%)			
Sodium	5000		8250	12700	ug/L	0.903	88.5	(0%-20%)		09/04/14	07:28
Strontium	500		308	767	ug/L	0.977	91.8	(0%-20%)			
Vanadium	500	U	ND	553	ug/L	1.33	110	(0%-20%)		08/18/14	19:25
Zinc	500	U	ND	519	ug/L	1.15	104	(0%-20%)			
QC1203147428 354598008 SDILT											
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		08/18/14	19:29

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1411249										
Arsenic	U	ND DU		ND	ug/L	N/A		(0%-10%)	HSC	08/18/14	19:29
Barium		33.0 D		6.64	ug/L	.701		(0%-10%)			
Beryllium	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Cadmium	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Calcium		62900 D		12900	ug/L	2.23		(0%-10%)		09/04/14	07:31
Chromium		11.8 D		2.54	ug/L	7.83		(0%-10%)		08/18/14	19:29
Cobalt	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Copper	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Iron	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Magnesium		9350 D		1910	ug/L	2.12		(0%-10%)		09/04/14	07:31
Manganese	U	ND D		5.86	ug/L	N/A		(0%-10%)		08/18/14	19:29
Nickel	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Potassium		2270 D		613	ug/L	34.7		(0%-10%)			
Silver	U	ND DU		ND	ug/L	N/A		(0%-10%)			
Sodium		8250 D		1640	ug/L	.806		(0%-10%)		09/04/14	07:31
Strontium		308 D		61.9	ug/L	.492		(0%-10%)			
Vanadium	U	ND DU		ND	ug/L	N/A		(0%-10%)		08/18/14	19:29
Zinc	U	ND DU		ND	ug/L	N/A		(0%-10%)			

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995

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QC Summary

Workorder: 354598

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	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.										
E	Reported value is estimated due to interferences. See comment in narrative.										
M	Duplicate precision not met.										
N	Spike Sample recovery is outside control limits.										
S	Reported value determined by the Method of Standard Additions (MSA)										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

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

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

General Chem Analysis

Case Narrative

**General Chemistry Narrative
Hanford MSA (HMSA)
SDG GEL354598**

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1411239 **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
354598003	B2X604
354598007	B2X628
1203147415	MB for batch 1411239
1203147418	Laboratory Control Sample (LCS)
1203147416	354598003(B2X604) Sample Duplicate (DUP)
1203147417	354598003(B2X604) 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-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

The following sample was selected for QC analysis: 354598003 (B2X604).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203147417 (B2X604). The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203147417 (B2X604).

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 in this sample group were diluted due to high concentration: 1203147416 (B2X604), 1203147417 (B2X604), 354598003 (B2X604) and 354598007 (B2X628). The following samples were diluted based on historical data: 1203147416 (B2X604), 1203147417 (B2X604), 354598003 (B2X604) and 354598007 (B2X628).

Sample Re-analysis

The following sample was re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. 354598007 (B2X628).

Miscellaneous Information**Data Exception (DER) Documentation**

The following DER was generated for this SDG: 1324964. 1203147417 (B2X604).

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203147416 (B2X604), 1203147417 (B2X604), 354598003 (B2X604) and 354598007 (B2X628).

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:** Hexavalent Chromium**Analytical Batch:** 1411303**Method:** 7196_CR6: COMMON**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in 7196_CR6 :

Sample ID	Client ID
354598004	B2X603
1203147568	MB for batch 1411303
1203147569	Laboratory Control Sample (LCS)
1203147570	354598004(B2X603) Sample Duplicate (DUP)
1203147572	354598004(B2X603) 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-044 REV# 19.

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 Spectrometric analysis was performed on a Spectronic 20D+ Digital Spectrophotometer.

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: 354598004 (B2X603).

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

The following sample was received with insufficient time to prep and/or analyze within the remaining method-specified holding time. The sample was analyzed as soon as possible by the analyst. 354598004 (B2X603).

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**

The following DER was generated for this SDG: 1323809, 1203147570 (B2X603), 1203147572 (B2X603) and 354598004 (B2X603).

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: 1413063 **Method:** 2320_ALKALINITY: GW 01

Sample Analysis

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

Sample ID	Client ID
354598002	B2X601
354598006	B2X626
1203152138	MB for batch 1413063
1203152145	Laboratory Control Sample (LCS)
1203152140	354618009(B2X7P2) Sample Duplicate (DUP)
1203152143	354618009(B2X7P2) Matrix Spike (MS)

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

SOP Reference

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

The following sample was selected for QC analysis: 354618009 (B2X7P2).

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 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.

Additional Comments

50mL of the following sample was used for analysis due to limited quantity and its selection for QC 1203152140 (B2X7P2) and 1203152143 (B2X7P2).

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.

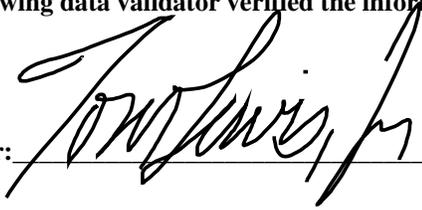
Certification Statement

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: 08Sep14

Sample Data Summary

GEL LABORATORIES LLC

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**Certificate of Analysis Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL354598 GEL Work Order: 354598

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

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



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 I14-035**

Report Date: September 5, 2014

Client Sample ID: B2X601
 Lab Sample ID: 354598002
 Matrix: WATER
 Collect Date: 12-AUG-14 09:01
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
<i>2320_ALKALINITY: GW 01 "As Received"</i>												
Alkalinity, Total as CaCO3		107000	725	1000	1000	ug/L	PX01	08/20/14	15:19	1413063	1	
Bicarbonate alkalinity (CaCO3)		107000	725	1000	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	1000	725	1000	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	1000	725	1000	1000	ug/L						

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	2320_ALKALINITY	

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 I14-035**

Report Date: September 5, 2014

Client Sample ID: B2X604
 Lab Sample ID: 354598003
 Matrix: WATER
 Collect Date: 12-AUG-14 09:01
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
<i>9056_ANIONS_IC: COMMON "As Received"</i>												
Fluoride	B	219	33.0	100	500	ug/L	1	RXB5	08/13/14	23:30	1411239	1
Nitrite-N	U	100	38.0	100	250	ug/L	1					
Chloride	D	13400	335	1000	200	ug/L	5	RXB5	08/14/14	02:07	1411239	2
Nitrate-N	D	3010	165	500	250	ug/L	5					
Sulfate	D	70200	665	2000	500	ug/L	5					

The following Analytical Methods were performed

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

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 I14-035**

Report Date: September 5, 2014

Client Sample ID: B2X603
 Lab Sample ID: 354598004
 Matrix: WATER
 Collect Date: 12-AUG-14 09:01
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
<i>7196_CR6: COMMON "As Received"</i>												
Hexavalent Chromium	BX	0.00759	0.003	0.010	0.010	mg/L	1	SXC5	08/13/14	15:08	1411303	1

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	7196_CR6	

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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 I14-035**

Report Date: September 5, 2014

Client Sample ID: B2X626
 Lab Sample ID: 354598006
 Matrix: WATER
 Collect Date: 11-AUG-14 11:12
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Titration and Ion Analysis												
<i>2320_ALKALINITY: GW 01 "As Received"</i>												
Alkalinity, Total as CaCO3		102000	725	1000	1000	ug/L	PX01	08/20/14	15:21	1413063	1	
Bicarbonate alkalinity (CaCO3)		102000	725	1000	1000	ug/L						
Carbonate alkalinity (CaCO3)	U	1000	725	1000	1000	ug/L						
Hydroxide alkalinity as CaCO3	U	1000	725	1000	1000	ug/L						

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	2320_ALKALINITY	

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 I14-035**

Report Date: September 5, 2014

Client Sample ID: B2X628
 Lab Sample ID: 354598007
 Matrix: WATER
 Collect Date: 11-AUG-14 11:12
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001
 Client SDG: GEL354598

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
<i>9056_ANIONS_IC: COMMON "As Received"</i>												
Nitrite-N	U	100	38.0	100	250	ug/L	1	RXB5	08/13/14	12:31	1411239	1
Chloride	D	12600	335	1000	200	ug/L	5	RXB5	08/13/14	13:34	1411239	2
Nitrate-N	D	5940	165	500	250	ug/L	5					
Sulfate	D	71300	665	2000	500	ug/L	5					
Fluoride	B	155	33.0	100	500	ug/L	1	RXB5	08/16/14	06:24	1411239	3

The following Analytical Methods were performed

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 5, 2014

Page 1 of 3

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 354598

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1411239										
QC1203147416	354598003	DUP									
Chloride	D	13400	D	13200	ug/L	1.60		(0%-20%)	RXB5	08/14/14	02:38
Fluoride	B	219	B	217	ug/L	0.735	^	(+/-500)		08/14/14	00:01
Nitrate-N	D	3010	D	2930	ug/L	2.78		(0%-20%)		08/14/14	02:38
Nitrite-N	U	ND	U	ND	ug/L	N/A				08/14/14	00:01
Sulfate	D	70200	D	69800	ug/L	0.579		(0%-20%)		08/14/14	02:38
QC1203147418	LCS										
Chloride	5000			5050	ug/L			101	(90%-110%)	08/14/14	06:18
Fluoride	2500			2690	ug/L			108	(90%-110%)		
Nitrate-N	2500			2570	ug/L			103	(90%-110%)		
Nitrite-N	2500			2550	ug/L			102	(90%-110%)		
Sulfate	10000			10200	ug/L			102	(90%-110%)		
QC1203147415	MB										
Chloride			U	ND	ug/L					08/14/14	05:47
Fluoride			U	ND	ug/L						
Nitrate-N			U	ND	ug/L						
Nitrite-N			U	ND	ug/L						
Sulfate			U	ND	ug/L						
QC1203147417	354598003	PS									
Chloride	5.00	D	2.68	D	8.17	mg/L		110	(90%-110%)	08/14/14	03:10
Fluoride	2.50	B	0.219		2.93	mg/L		109	(90%-110%)	08/14/14	00:33
Nitrate-N	2.50	D	0.603	D	3.28	mg/L		107	(90%-110%)	08/14/14	03:10

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QC Summary

Workorder: 354598

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1411239										
Nitrite-N	2.50	U	ND	2.59	mg/L		104	(90%-110%)		08/14/14	00:33
Sulfate	10.0	D	14.0 D	25.5	mg/L		115*	(90%-110%)	RXB5	08/14/14	03:10
Spectrometric Analysis											
Batch	1411303										
QC1203147570	354598004	DUP									
Hexavalent Chromium		BX	0.00759	BX	0.00759	mg/L	0.00 ^	(+/-0.010)	SXC5	08/13/14	15:09
QC1203147569	LCS										
Hexavalent Chromium	0.050				0.0531	mg/L		106	(85%-115%)		08/13/14 15:02
QC1203147568	MB										
Hexavalent Chromium			U		ND	mg/L					08/13/14 15:02
QC1203147572	354598004	PS									
Hexavalent Chromium	0.050	BX	0.00759	X	0.0552	mg/L		95.1	(85%-115%)		08/13/14 15:10
Titration and Ion Analysis											
Batch	1413063										
QC1203152140	354618009	DUP									
Alkalinity, Total as CaCO3			118000		118000	ug/L	0.00	(0%-20%)	PXO1	08/20/14	15:31
QC1203152145	LCS										
Alkalinity, Total as CaCO3	50000				45500	ug/L		91	(90%-110%)		08/20/14 14:11
QC1203152138	MB										
Alkalinity, Total as CaCO3			U		ND	ug/L					08/20/14 14:11
Bicarbonate alkalinity (CaCO3)			U		ND	ug/L					
Carbonate alkalinity (CaCO3)			U		ND	ug/L					
Hydroxide alkalinity as CaCO3			U		ND	ug/L					
QC1203152143	354618009	MS									
Alkalinity, Total as CaCO3	100000		118000		207000	ug/L		88.3	(80%-120%)		08/20/14 15:33

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).

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QC Summary

Workorder: 354598

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples.										
D	Results are reported from a diluted aliquot of sample.										
N	Spike Sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
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. 13-AUG-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VIS SPECTROMETER	Test / Method: SM 3500 Cr B, SW846 7196A	Matrix Type: Liquid	Client Code: COLO, HMSA
Batch ID: 1411303	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 354018,354598(GEL354598)			
Application Issues: Sample Analyzed out of Holding Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: 354598 004 2. Sample received out of holding: 354018 001,002		1. Sample was analyzed out of holding due it being received by laboratory with insufficient time to prep and analyze. 2. Samples were received by laboratory outside of method specified holding time.	

Originator's Name:

Sarah Carson 13-AUG-14

Data Validator/Group Leader:

Kristen Parson 14-AUG-14

DATA EXCEPTION REPORT

Mo.Day Yr. 16-AUG-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1411239	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 354579(GEL354579),354586(GEL354586),354598(GEL354598)			
Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Samples Analyzed out of Holding: 354579 002,004		1. Samples were logged in for this analysis outside of the method specified holding time.	

Originator's Name:

Rachael Bell 16-AUG-14

Data Validator/Group Leader:

Thomas Lewis 05-SEP-14

Radiological Analysis

**Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL354598
Work Order 354598**

Method/Analysis Information

Product: GAMMA_GS:COMMON + GW 01

Analytical Method: 901.1_GAMMA_GS

Analytical Batch Number: 1411417

Sample ID	Client ID
354598006	B2X626
354598009	B2X6H0
354598011	B2X6H1
1203147881	MB for batch 1411417
1203147883	Laboratory Control Sample (LCS)
1203147882	354618015(B2X807) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 354618015 (B2X807).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
X	Data rejected due to no valid peak.	Potassium-40	1203147881	MB for batch 1411417

Method/Analysis Information

Product: SRTOT_SEP_PRECIP_GPC: COMMON
Analytical Method: SRTOT_SEP_PRECIP_GPC
Analytical Batch Number: 1413281

Sample ID	Client ID
354598006	B2X626
354598009	B2X6H0
354598011	B2X6H1
1203152727	MB for batch 1413281
1203152729	Laboratory Control Sample (LCS)
1203152728	354346009(B2X744) Sample Duplicate (DUP)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 354346009 (B2X744).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Recounts

Sample 1203152728 (B2X744) was recounted due to high relative percent difference/relative error ratio. The recount is reported. Sample 354598009 (B2X6H0) was recounted due to a suspected false positive. The recount is reported. Sample 354598011 (B2X6H1) was recounted to verify sample result. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

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

Sample-Specific MDA/MDC

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

Additional Comments

Sample 354598011 (B2X6H1) was verified by recounting at least five days from the separation date.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TRITIUM_DIST_LSC: COMMON

Analytical Method: TRITIUM_DIST_LSC

Analytical Batch Number: 1412711

Sample ID	Client ID
354598006	B2X626
1203151175	MB for batch 1412711
1203151178	Laboratory Control Sample (LCS)
1203151176	354894002(B2WMX8) Sample Duplicate (DUP)
1203151177	354894002(B2WMX8) Matrix Spike (MS)

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

SOP Reference

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

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:**Blank Information**

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

Designated QC

The following sample was used for QC: 354894002 (B2WMX8).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

Sample 354598006 (B2X626) was recounted to verify results. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: TC99_EIE_LSC: COMMON

Analytical Method: TC99_EIE_LSC

Analytical Batch Number: 1412724

Sample ID	Client ID
354598006	B2X626
354598009	B2X6H0
354598011	B2X6H1
1203151207	MB for batch 1412724
1203151209	Laboratory Control Sample (LCS)
1203151208	354894002(B2WMX8) Sample Duplicate (DUP)

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

SOP Reference

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

GL-RAD-A-059 REV# 3.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

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

Sample Geometry

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

Quality Control (QC) Information:

Blank Information

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

Designated QC

The following sample was used for QC: 354894002 (B2WMX8).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

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

Recounts

Samples 1203151208 (B2WMX8), 354598006 (B2X626) and 354598011 (B2X6H1) were recounted to verify sample results. Recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

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

Sample-Specific MDA/MDC

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

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

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

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**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL354598 GEL Work Order: 354598

The Qualifiers in this report are defined as follows:

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

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

Review/Validation

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

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

Signature:**Name: Kate Gellatly****Date: 09 SEP 2014****Title: Analyst I**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

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

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I14-035

Report Date: September 9, 2014

Client Sample ID: B2X626
 Sample ID: 354598006
 Matrix: WATER
 Collect Date: 11-AUG-14
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
<i>GAMMA_GS:COMMON + GW 01 "As Received"</i>													
Antimony-125	U	-0.133	+/-8.03	13.1	+/-8.03		pCi/L		MJH1	08/22/14	0855	1411417	1
Cesium-134	U	-0.952	+/-2.97	5.26	+/-3.00		pCi/L						
Cesium-137	U	-0.86	+/-2.33	4.19	+/-2.37	10.0	pCi/L						
Cobalt-60	U	0.696	+/-1.88	4.06	+/-1.91		pCi/L						
Europium-152	U	3.63	+/-8.13	13.5	+/-8.30		pCi/L						
Europium-154	U	-3.66	+/-6.62	11.7	+/-6.83		pCi/L						
Europium-155	U	-1.23	+/-8.23	14.2	+/-8.25		pCi/L						
Potassium-40	U	7.58	+/-33.5	49.0	+/-33.5		pCi/L						
Rad Gas Flow Proportional Counting													
<i>SRTOT_SEP_PRECIP_GPC: COMMON "As Received"</i>													
Total Strontium	U	-0.316	+/-1.05	1.99	+/-1.05	2.00	pCi/L		KSD1	08/30/14	1623	1413281	2
Rad Liquid Scintillation Analysis													
<i>TC99_EIE_LSC: COMMON "As Received"</i>													
Technetium-99		75.7	+/-8.40	9.48	+/-11.9	15.0	pCi/L		MYM 1	09/04/14	1608	1412724	3
<i>TRITIUM_DIST_LSC: COMMON "As Received"</i>													
Tritium		2020	+/-329	203	+/-510	100	pCi/L		BYS1	08/30/14	2238	1412711	4

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	DOE EML HASL-300, Tc-02-RC Modified
4	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier	SRTOT_SEP_PRECIP_GPC: COMMON "As Received"	1413281	96.7	(25%-125%)
Technetium-99m Tracer	TC99_EIE_LSC: COMMON "As Received"	1412724	96.3	(15%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

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

Report Date: September 9, 2014

Contact: Mr. Scot Fitzgerald

Project: CHPRC SAF I14-035

Client Sample ID: B2X626

Sample ID: 354598006

Project: HMSA00186

Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test								Batch ID	Recovery%	Acceptable Limits	

Notes:

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

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Certificate of Analysis

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

Report Date: September 9, 2014

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I14-035

Client Sample ID: B2X6H0
 Sample ID: 354598009
 Matrix: WATER
 Collect Date: 11-AUG-14
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
<i>GAMMA_GS:COMMON + GW 01 "As Received"</i>													
Antimony-125	U	1.56	+/-6.38	12.0	+/-6.42		pCi/L		MJH1	08/22/14	0856	1411417	1
Cesium-134	U	1.20	+/-2.35	4.85	+/-2.41		pCi/L						
Cesium-137	U	-1.44	+/-2.69	4.55	+/-2.77	10.0	pCi/L						
Cobalt-60	U	-0.0526	+/-2.74	5.20	+/-2.74		pCi/L						
Europium-152	U	-1.2	+/-7.74	14.0	+/-7.76		pCi/L						
Europium-154	U	-3.92	+/-6.19	10.6	+/-6.45		pCi/L						
Europium-155	U	10.8	+/-15.5	17.7	+/-16.3		pCi/L						
Potassium-40	U	-14.7	+/-29.5	55.6	+/-30.3		pCi/L						
Rad Gas Flow Proportional Counting													
<i>SRTOT_SEP_PRECIP_GPC: COMMON "As Received"</i>													
Total Strontium	U	1.83	+/-1.20	1.90	+/-1.28	2.00	pCi/L		KSD1	09/03/14	1344	1413281	2
Rad Liquid Scintillation Analysis													
<i>TC99_EIE_LSC: COMMON "As Received"</i>													
Technetium-99	U	9.79	+/-7.43	12.3	+/-7.50	15.0	pCi/L		MYM	09/02/14	0945	1412724	3

The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier		SRTOT_SEP_PRECIP_GPC: COMMON "As Received"	1413281	103	(25%-125%)
Technetium-99m Tracer		TC99_EIE_LSC: COMMON "As Received"	1412724	96.0	(15%-125%)

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Certificate of Analysis

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

Report Date: September 9, 2014

Contact: Mr. Scot Fitzgerald

Project: CHPRC SAF I14-035

Client Sample ID: B2X6H0
 Sample ID: 354598009

Project: HMSA00186
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test					Batch ID	Recovery%	Acceptable Limits				

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

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Certificate of Analysis

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

Report Date: September 9, 2014

Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I14-035

Client Sample ID: B2X6H1
 Sample ID: 354598011
 Matrix: WATER
 Collect Date: 11-AUG-14
 Receive Date: 13-AUG-14
 Collector: Client

Project: HMSA00186
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gamma Spec Analysis													
<i>GAMMA_GS:COMMON + GW 01 "As Received"</i>													
Antimony-125	U	-4.13	+/-6.17	10.5	+/-6.46		pCi/L		MJH1	08/22/14	0856	1411417	1
Cesium-134	U	2.23	+/-2.57	5.32	+/-2.77		pCi/L						
Cesium-137	U	0.254	+/-2.93	5.26	+/-2.93	10.0	pCi/L						
Cobalt-60	U	-2.21	+/-2.38	3.65	+/-2.58		pCi/L						
Europium-152	U	-5.13	+/-7.05	12.1	+/-7.43		pCi/L						
Europium-154	U	5.44	+/-5.88	14.8	+/-6.39		pCi/L						
Europium-155	U	5.94	+/-9.26	17.0	+/-9.66		pCi/L						
Potassium-40	U	25.7	+/-38.9	44.6	+/-39.0		pCi/L						

Rad Gas Flow Proportional Counting*SRTOT_SEP_PRECIP_GPC: COMMON "As Received"*

Total Strontium		1.63	+/-0.964	1.47	+/-1.04	2.00	pCi/L		KSD1	09/03/14	1344	1413281	2
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Rad Liquid Scintillation Analysis*TC99_EIE_LSC: COMMON "As Received"*

Technetium-99		21.7	+/-6.31	9.31	+/-6.75	15.0	pCi/L		MYM	09/04/14	1630	1412724	3
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The following Analytical Methods were performed

Method	Description
1	EPA 901.1
2	EPA 905.0 Modified
3	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Strontium Carrier		SRTOT_SEP_PRECIP_GPC: COMMON "As Received"	1413281	99.3	(25%-125%)
Technetium-99m Tracer		TC99_EIE_LSC: COMMON "As Received"	1412724	96.6	(15%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

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

Report Date: September 9, 2014

Contact: Mr. Scot Fitzgerald

Project: CHPRC SAF I14-035

Client Sample ID: B2X6H1
 Sample ID: 354598011

Project: HMSA00186
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer	Recovery	Test					Batch ID	Recovery%	Acceptable Limits				

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

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: September 9, 2014
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Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 354598

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1411417								
QC1203147881	MB								
Antimony-125			U	5.58	pCi/L			MJH1	08/22/1409:06
				Uncert: +/-7.07					
				TPU: +/-7.52					
Cesium-134			U	-2.2	pCi/L				
				Uncert: +/-2.92					
				TPU: +/-3.09					
Cesium-137			U	-1.16	pCi/L				
				Uncert: +/-3.07					
				TPU: +/-3.12					
Cobalt-60			U	1.59	pCi/L				
				Uncert: +/-2.44					
				TPU: +/-2.55					
Europium-152			U	-2.9	pCi/L				
				Uncert: +/-6.99					
				TPU: +/-7.11					
Europium-154			U	-1.7	pCi/L				
				Uncert: +/-6.38					
				TPU: +/-6.43					
Europium-155			U	6.20	pCi/L				
				Uncert: +/-9.65					
				TPU: +/-10.1					
Potassium-40			UX	0.00	pCi/L				
				Uncert: +/-32.7					
				TPU: +/-32.9					
QC1203147882	354618015	DUP							
Antimony-125		U	-1.61	U	0.621	pCi/L			08/22/1411:06
			Uncert: +/-8.00		+/-7.35		RPD: 0	N/A	
			TPU: +/-8.03		+/-7.35		RER: 0.401	(0-2)	
Cesium-134		U	0.260	U	0.0174	pCi/L			
			Uncert: +/-2.53		+/-2.32		RPD: 0	N/A	
			TPU: +/-2.53		+/-2.32		RER: 0.138	(0-2)	
Cesium-137		U	1.93	U	0.635	pCi/L			
			Uncert: +/-2.55		+/-2.56		RPD: 0	N/A	
			TPU: +/-2.70		+/-2.57		RER: 0.681	(0-2)	
Cobalt-60		U	2.79	U	2.85	pCi/L			
			Uncert: +/-5.07		+/-4.16		RPD: 0	N/A	
			TPU: +/-5.22		+/-4.17		RER: 0.0167	(0-2)	
Europium-152		U	-1.34	U	3.25	pCi/L			
			Uncert: +/-8.36		+/-7.47		RPD: 0	N/A	
			TPU: +/-8.39		+/-7.62		RER: 0.793	(0-2)	
Europium-154		U	1.32	U	4.64	pCi/L			
			Uncert: +/-7.18		+/-7.30		RPD: 0	N/A	
			TPU: +/-7.21		+/-7.60		RER: 0.620	(0-2)	
Europium-155		U	3.41	U	2.49	pCi/L			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gamma Spec									
Batch	1411417								
		Uncert:	+/-10.8	+/-9.66					
		TPU:	+/-11.0	+/-9.73		RPD: 0	N/A		
						RER: 0.122	(0-2)		
Potassium-40		U	4.47	U	6.10	pCi/L			
		Uncert:	+/-40.4	+/-35.4		RPD: 0	N/A		
		TPU:	+/-40.4	+/-35.5		RER: 0.0596	(0-2)		
QC1203147883	LCS								
Americium-241	34500			40200	pCi/L	REC: 116	(80%-120%)		08/22/1409:16
		Uncert:		+/-1250					
		TPU:		+/-3810					
Antimony-125				U	162	pCi/L			
		Uncert:		+/-219					
		TPU:		+/-231					
Cesium-134				U	17.2	pCi/L			
		Uncert:		+/-94.2					
		TPU:		+/-94.5					
Cesium-137	14000			14700	pCi/L	REC: 105	(80%-120%)		
		Uncert:		+/-339					
		TPU:		+/-1240					
Cobalt-60	17200			18300	pCi/L	REC: 107	(80%-120%)		
		Uncert:		+/-413					
		TPU:		+/-1480					
Europium-152				U	88.1	pCi/L			
		Uncert:		+/-220					
		TPU:		+/-224					
Europium-154				U	22.0	pCi/L			
		Uncert:		+/-136					
		TPU:		+/-136					
Europium-155				U	-17.7	pCi/L			
		Uncert:		+/-255					
		TPU:		+/-255					
Potassium-40				U	74.1	pCi/L			
		Uncert:		+/-372					
		TPU:		+/-374					
Rad Gas Flow									
Batch	1413281								
QC1203152727	MB								
Total Strontium				U	-1.2	pCi/L		KSD1	08/30/1416:22
		Uncert:			+/-0.938				
		TPU:			+/-0.938				
QC1203152728	354346009	DUP							
Total Strontium		U	-0.352	U	-0.375	pCi/L			09/02/1417:54
		Uncert:	+/-0.559		+/-0.531		RPD: 0	N/A	
		TPU:	+/-0.560		+/-0.531		RER: 0.0594	(0-2)	
QC1203152729	LCS								
Total Strontium	113				116	pCi/L	REC: 103	(80%-120%)	08/30/1416:30
		Uncert:			+/-5.96				
		TPU:			+/-27.8				
Rad Liquid Scintillation									
Batch	1412711								

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Liquid Scintillation										
Batch	1412711									
QC1203151175	MB									
Tritium			U	-0.982	pCi/L			BYS1	08/28/1412:24	
				Uncert: +/-47.2						
				TPU: +/-47.2						
QC1203151176	354894002	DUP								
Tritium			110	129	pCi/L				08/28/1414:26	
				Uncert: +/-53.2		RPD: 16 (0% - 100%)				
				TPU: +/-57.3		RER: 0.439 (0-2)				
QC1203151177	354894002	MS								
Tritium			1760	110	pCi/L	REC: 117 (75%-125%)			08/28/1416:29	
				Uncert: +/-53.2						
				TPU: +/-57.3						
QC1203151178	LCS									
Tritium			1760	1600	pCi/L	REC: 91 (80%-120%)			08/28/1416:46	
				Uncert: +/-291						
				TPU: +/-425						
Batch	1412724									
QC1203151207	MB									
Technetium-99			U	1.31	pCi/L			MYM1	09/02/1413:00	
				Uncert: +/-7.00						
				TPU: +/-7.00						
QC1203151208	354894002	DUP								
Technetium-99			19.6	28.4	pCi/L				09/02/1413:21	
				Uncert: +/-7.49		RPD: 37 (0% - 100%)				
				TPU: +/-7.80		RER: 1.12 (0-2)				
QC1203151209	LCS									
Technetium-99			290	272	pCi/L	REC: 94 (80%-120%)			09/02/1413:45	
				Uncert: +/-14.1						
				TPU: +/-33.2						

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- A The TIC is a suspected aldol-condensation product
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- E Reported value is estimated due to interferences. See comment in narrative.

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
J										
M										
N										
P										
S										
T										
U										
W										
X										
Y										
Z										
o										

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

** Indicates analyte is a surrogate compound.

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

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

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