

JULY 2, 2014



a member of **The GEL Group** INC



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

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www.gel.com

July 02, 2014

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

Re: CHPRC SAF X14-042
Work Order: 350049
SDG: GEL350049

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 05, 2014. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

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

Heather Shaffer
Project Manager

Purchase Order: 300071ES20

Chain of Custody: X14-042-052, X14-042-053, X14-042-054, X14-042-055, X14-042-070, X14-042-071, X14-042-072, X14-042-073, X14-042-074, X14-042-075, X14-042-076, X14-042-077, X14-042-078 and X14-042-079

Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....4

Data Review Qualifier Definitions.....20

Laboratory Certifications.....22

FID Diesel Range Organics Analysis.....24

 Case Narrative.....25

 Sample Data Summary.....30

 Quality Control Summary.....34

Metals Analysis.....37

 Case Narrative.....38

 Sample Data Summary.....44

 Quality Control Summary.....60

General Chem Analysis.....67

 Case Narrative.....68

 Sample Data Summary.....73

 Quality Control Summary.....82

Miscellaneous.....86

Radiological Analysis.....88

 Sample Data Summary.....94

 Quality Control Data.....102

Case Narrative

**General Narrative
for
Hanford MSA (51204)
CHPRC SAF X14-042
SDG: GEL350049**

July 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 June 05, 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 the hold times for Nitrate and Nitrite. The initial runs for the samples were in holding, but the holding time had expired prior to diluted runs. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
350049001	B2WRY2
350049002	B2WRY1
350049003	B2WT06
350049004	B2WT05
350049005	B2WT72
350049006	B2WT73
350049007	B2WT81
350049008	B2WT82
350049009	B2WT90
350049010	B2WT91
350049011	B2WT99
350049012	B2WTB0
350049013	B2WTC3
350049014	B2WTC4
350049015	B2WT92
350049016	B2WTB1
350049017	B2WT07
350049018	B2WRY3
350049019	B2WT74
350049020	B2WT83
350049021	B2WTC5

JULY 2, 2014

Case Narrative

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

Data Package

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

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X14-042-054** Page 1 of 1

Collector: **J.R. Aguilar** Telephone No. **509-376-4650**
CHPRC

SAF No. **X14-042** Contact/Requester: **Karen Waters-Husted**
509-376-4650

Project Title: **100-NR-2 APATITE BARRIER, JUNE 2** Sampling Origin: **Hanford Site**
Logbook No. HNF-N-506 64 / 48-49

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

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

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Hold Time	Preservative
B2WT06	Y	W	6-3-14	1219	1x500-mL G/P	-6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT06	Y	W			1x500-mL G/P	-ALPHA_GPC_DISCRETE: COMMON; BETA_GPC: COMMON	6 Months	HNO3 to pH <2
B2WT06	Y	W			1x1-L G/P	-SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B2WT06	Y	W			3x1-L aG	WTPH_DIESEL: COMMON	14/40 Days	HCl to pH <2/Cool <=6C
B2WT05	N	W	6-3-14	1219	1x500-mL G/P	-6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2

Total Activity Exemption: Yes No

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
J.R. Aguilar			JUN 03 2014 1410	SSU # 1			JUN 03 2014 1410	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			JUN 04 2014 0800	L.D. Wall			JUN 04 2014 0800	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			JUN 04 2014 1400	L.D. Wall			JUN 04 2014 1400	
Relinquished By				H. Taylor			6/5/14 0900	

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

Disposed By

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

X14-042-070

Page 1 of 1

Collector: S.W. King
CHPRC
SAF No.: X14-042
Project Title: 100-NR-2 APATITE BARRIER, JUNE 2
Shipped To (Lab): GEL Laboratories, LLC
Protocol: CERCLA
Contact/Requester: Karen Waters-Husted
Sampling Origin: Hanford Site
Logbook No.: HNF-N-506 *66/15*
Method of Shipment: Commercial Carrier
Priority: 30 Days **PRIORITY**
Telephone No.: 509-376-4650
Purchase Order/Charge Code: 300071ES20
Ice Chest No.: *6WS-322*
Bill of Lading/Air Bill No.: *770196055608*
Offsite Property No.: *4839*

Hold Time: _____ **Hold Time:** _____ **Total Activity Exemption:** Yes No
SPECIAL INSTRUCTIONS: _____
POSSIBLE SAMPLE HAZARDS/REMARKS: _____
 *** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR /LATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2WT72	N	W	<i>JUN 0 4 2014</i>	<i>0840</i>	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT73	Y	W	<i>JUN 0 4 2014</i>	<i>↓</i>	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT73	Y	W	<i>JUN 0 4 2014</i>	<i>↓</i>	1x500-mL G/P	ALPHA_GPC,DISCRETE: COMMON; BETA_GPC: COMMON	6 Months	HNO3 to pH <2
B2WT73	Y	W	<i>JUN 0 4 2014</i>	<i>0840</i>	1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2

Relinquished By: S.W. King *[Signature]* **Date/Time:** *JUN 0 4 2014 1030*
Received By: JC Fulton *[Signature]* **Date/Time:** *JUN 0 4 2014 1030*
Relinquished By: S.W. King *[Signature]* **Date/Time:** *JUN 0 4 2014 140*
Received By: JC Fulton *[Signature]* **Date/Time:** *JUN 0 4 2014 140*
Relinquished By: S.W. King *[Signature]* **Date/Time:** *JUN 0 4 2014 140*
Received By: F. Taylor *[Signature]* **Date/Time:** *JUN 0 4 2014 0900*
Relinquished By: S.W. King *[Signature]* **Date/Time:** *JUN 0 4 2014 0840*
Received By: F. Taylor *[Signature]* **Date/Time:** *JUN 0 4 2014 0900*

Matrix *

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

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.# **X14-042-072** Page 1 of 1

Collector: **S.W. King** Telephone No. **509-376-4650**

CHPRC
X14-042
Purchase Order/Charge Code **30007IES20**

Project Title: **100-NR-2 APATITE BARRIER, JUNE 2** Sampling Origin: **Hanford Site**

Shipped To (Lab): **GEL Laboratories, LLC** Logbook No. **HNF-N-506** Ice Chest No. **6005-322**

Protocol: **CERCLA** Method of Shipment: **Commercial Carrier** Bill of Lading/Air Bill No. **770196055608**

Priority: **30 Days** Priority: **PRIORITY** Offsite Property No. **4839**

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2WT81	N	W	JUN 04 2014	0941	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT82	Y	W	JUN 04 2014	0941	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT82	Y	W	JUN 04 2014	0941	1x500-mL G/P	ALPHA_GPC_DISCRETE: COMMON; BETA_GPC: COMMON	6 Months	HNO3 to pH <2
B2WT82	Y	W	JUN 04 2014	0941	1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2

Hold Time: _____ Total Activity Exemption: Yes No

Received By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Received By: S.W. King			JUN 04 2014 1030	Received By: J.C. Fulton			JUN 04 2014 1030	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
Received By: CHPRC				Received By: CHPRC				
Received By: CHPRC				Received By: FREDEN				
Received By: CHPRC				Received By: H. Taylor				
Received By: CHPRC				Received By: Fedex				

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

Disposed By: _____ Date/Time: _____

PRINTED ON 5/9/2014

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X14-042-074**

Page 1 of 1

Collector: **S.W. King CHPRC**

SAF No.: **X14-042**

Project Title: **100-NR-2 APATITE BARRIER, JUNE 2**

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

Protocol: **CERCLA**

Contact/Requester: **Karen Waters-Husted**

Sampling Origin: **Hanford Site**

Logbook No.: **HNF-N-506 (see 15)**

Method of Shipment: **Commercial Carrier**

Priority: **30 Days**

Offsite Property No.: **4840**

Telephone No.: **509-376-4650**

Purchase Order/Charge Code: **30007IES20**

Ice Chest No.: **(205-317)**

Bill of Lading/Air Bill No.:

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2WT90	N	W	JUN 04 2014	1041	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT91	Y	W	↑	↑	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WT91	Y	W	↑	↑	1x500-mL G/P	ALPHA_GPC_DISCRETE: COMMON; BETA_GPC: COMMON	6 Months	HNO3 to pH <2
B2WT91	Y	W	JUN 04 2014	1041	1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2

Hold Time: _____ Total Activity Exemption: Yes No

SPECIAL INSTRUCTIONS

Print Sign

Received By: **JC Fulton** (Print) **JC Fulton** (Sign) Date/Time: **JUN 04 2014 1300**

Received By: **CHPRC** (Print) **CHPRC** (Sign) Date/Time: **JUN 04 2014 1300**

Received By: **Fedex** (Print) **Fedex** (Sign) Date/Time: **JUN 04 2014 1400**

Received By: **H. Taylor** (Print) **H. Taylor** (Sign) Date/Time: **JUN 04 2014 0900**

Received By: _____ (Print) _____ (Sign) Date/Time: _____

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

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

Disposed By: _____ Date/Time: _____

PRINTED ON 5/9/2014

A-6004-842 (REV 2)

CH2M Hill Plateau Remediation Company C.O.C.# **X14-042-076**

Page 1 of 1

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: **S.W. King** / **CHPRC** / X14-042 / Telephone No. **509-376-4650**

Project Title: **100-NR-2-APATITE BARRIER, JUNE 2** / Logbook No. **HNF-N-506 15/666** / Purchase Order/Charge Code **300071ES20**

Shipped To (Lab): **GEL Laboratories, LLC** / Method of Shipment **Commercial Carrier** / Ice Chest No. **GWS-017** / Bill of Lading/Air Bill No.

Protocol: **CERCLA** / Priority: **30 Days** / Offsite Property No. **4940**

POSSIBLE SAMPLE HAZARDS/REMARKS

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

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

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2WT99	N	W JUN 04 2014	1140	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WTB0	Y	W JUN 04 2014	1140	1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 05	6 Months	HNO3 to pH <2
B2WTB0	Y	W JUN 04 2014	1140	1x500-mL G/P	ALPHA_GPC_DISCRETE: COMMON; BETA_GPC: COMMON	6 Months	HNO3 to pH <2
B2WTB0	Y	W JUN 04 2014	1140	1x1-L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2

Received By: *[Signature]* **JC Fulton** / **CHPRC** / Date/Time: **JUN 04 2014 1200** / Sign: *[Signature]*

Received By: *[Signature]* **CHPRC** / Date/Time: **JUN 04 2014 1400** / Sign: *[Signature]*

Received By: *[Signature]* **H. Taylor** / **060514 0910** / Date/Time: **060514 0910** / Sign: *[Signature]*

Received By: *[Signature]* / Date/Time: / 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

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

PRINTED ON 5/9/2014 / A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # X14-042-075
				Page 1 of 1
Collector	S.W. King CHPRC	Contact/Requester	Karen Waters-Husted	
SAF No.	X14-042	Sampling Origin	Hanford Site	
Project Title	100-NR-2 APATITE BARRIER, JUNE 2	Logbook No.	HNF-N-506 <i>46/15</i>	
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	
Protocol	CERCLA	Priority:	30 Days PRIORITY	
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time
** 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>
Sample No.	Filter	Date	Time	No/Type Container
B2WT92	Y	JUN 04 2014	1041	1x250-mL G/P
				9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 01
				Sample Analysis
				Holding Time
				28 Days/48 Hours
				Preservative
				Cool <=6C

Received By	Print	Sign	Date/Time	Date/Time	Matrix *
Received By	JC Fulton	<i>[Signature]</i>	JUN 04 2014	1300	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
Received By	FEDER	<i>[Signature]</i>	JUN 04 2014	1400	
Received By	H Taylor	<i>[Signature]</i>	JUN 04 2014	0910	
Received By		<i>[Signature]</i>			
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Date/Time	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # X14-042-055
J.R. Aguilar CHPRC		Contact/Requester	Karen Waters-Husted		Telephone No.	509-376-4650
SAF No.	X14-042	Sampling Origin	Hanford Site		Purchase Order/Charge Code	300071ES20
Project Title	100-NR-2 APATITE BARRIER, JUNE 2	Logbook No.	HNF-N-506 64 / 48-49		Ice Chest No.	6005-180
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier		Bill of Lading/Air Bill No.	
Protocol	CERCLA	Priority:	30 Days	PRIORITY	Offsite Property No.	
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1						
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B2WT07	Y	6-3-14	1219	1x250-ml G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 01	28 Days/48 Hours Cool <=6C

Received By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.R. Aguilar			JUN 03 2014 1410	SSU #1			JUN 03 2014 1410
Relinquished By				LD. Wall			JUN 04 2014 0800
SSU #1				CHPRC			
Relinquished By				FEDEX			
LD. Wall			JUN 04 2014 1400				JUN 04 2014 0800
CHPRC							
Relinquished By				H. Taylor			JUN 04 2014 0900
FEDEX							

Page 16 of 107

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # X14-042-053
J.R. Aguilar CHPRC		Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	Page 1 of 1
SAF No.	X14-042	Sampling Origin Hanford Site	Purchase Order/Charge Code 30007IES20	
Project Title	100-NR-2 APATITE BARRIER, JUNE 2	Logbook No. HNF-N-506 64 / 50	Ice Chest No. 605-322	
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 70196055608	
Protocol	CERCLA	Priority: 30 Days	Offsite Property No. 4839	
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		
*** ** 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		Hold Time Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Sample No.	Filter	Date	Time	No/Type Container
B2WR73	Y	6-4-14	0843	1x250-mL G/P
				9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 01
				Sample Analysis
				Holding Time 28 Days/48 Hours
				Preservative Cool <=6C

Received By J.R. Aguilar CHPRC	Print 	Sign J.C. Fulton CHPRC	Date/Time JUN 04 2014 1030	Date/Time JUN 04 2014 1030	Received By J.C. Fulton CHPRC	Print 	Sign H. Taylor	Date/Time JUN 04 2014 0900	Date/Time JUN 04 2014 0900	Received By H. Taylor	Print 	Sign 60514	Date/Time JUN 04 2014 0900	Date/Time JUN 04 2014 0900	Matrix *
Received By J.C. Fulton CHPRC	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Matrix *
Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Matrix *
Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Received By FEDX	Print 	Sign FEDX	Date/Time JUN 04 2014 1400	Date/Time JUN 04 2014 1400	Matrix *
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)															
Disposed By _____ Date/Time _____															

CH2M/Hill Plateau Remediation Company		C.O.C. # X14-042-071	
Collector: J.R. Zunker CHPRC		Contact/Requester: Karen Waters-Husted	Telephone No. 509-376-4650
SAF No. X14-042		Sampling Origin: Hanford Site	Purchase Order/Charge Code: 30007IES20
Project Title: 100-NR-2 APATITE BARRIER, JUNE 2		Logbook No. HNF-N-506	Ice Chest No. 605-322
Shipped To (Lab): GEL Laboratories, LLC		Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No. 770196055608
Protocol: CERCLA		Priority: 30 Days	Offsite Property No. 4839
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Sample No. B2W774	Filter: Y	Date: JUN 04 2014 0840	Time: 0840
No./Type Container: 1x250-ml G/P	Sample Analysis: 9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 01	Holding Time: 28 Days/48 Hours	Preservative: Cool <=6C

Received By: S.W. King CHPRC	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 04 2014 1030
Received By: JC Fujiton CHPRC	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 04 2014 1030
Received By: FADEx	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 04 2014 1200
Received By: H. Taylor	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 04 2014 0800
Received By: Fedex	Print: [Signature]	Sign: [Signature]	Date/Time: JUN 04 2014 0800

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

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
PRINTED ON 5/9/2014			

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # X14-042-073
Collector S.W. King CHPRC		Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650	Page 1 of 1		
SAF No. X14-042		Sampling Origin Hanford Site	Purchase Order/Charge Code 300071ES20			
Project Title 100-NR-2 APATITE BARRIER, JUNE 2		Logbook No. HNF-N-506 <i>16/15</i>	Ice Chest No. 6WS-322			
Shipped To (Lab) GEL Laboratories, LLC		Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 770196055608			
Protocol CERCLA		Priority: 30 Days	Offsite Property No. 4839			
POSSIBLE SAMPLE HAZARDS/REMARKS		SPECIAL INSTRUCTIONS		Total Activity Exemption: Yes <input type="checkbox"/> No <input type="checkbox"/>		
*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1						
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Preservative
B2WT83	Y	JUN 0 4 2014	0941	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 01	Cool <=6C

Received By S.W. King CHPRC	Print 	Sign 	Date/Time JUN 0 4 2014 1030	Date/Time JUN 0 4 2014 1030	Matrix *	
			Received By JC Fulton CHPRC			Date/Time JUN 0 4 2014 0900
			Received By Fedex			
Received By H. Taylor	Print 	Sign 	Date/Time JUN 0 4 2014 0900	Date/Time JUN 0 4 2014 0900	Matrix *	
Received By Fedex	Print 	Sign 	Date/Time JUN 0 4 2014 0900	Date/Time JUN 0 4 2014 0900	Matrix *	

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. # X14-042-079
Collector	J.R. Aguilar CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No. 509-376-4650
SAF No.	X14-042	Sampling Origin	Hanford Site	Purchase Order/Charge Code 30007IES20
Project Title	100-NR-2 APATITE BARRIER, JUNE 2	Logbook No.	HNF-N-506 64 / 50	Ice Chest No. 605-322
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No. 770196053608
Protocol	CERCLA	Priority:	30 Days	Offsite Property No. 4839
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 <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Sample No.	Filter * Y W	Date 6-4-14	Time 0959	No/Type Container 1x250-mL G/P
B2WTC5				9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW.01
				Holding Time 28 Days/48 Hours
				Preservative Cool <=6C

Relinquished By J.R. Aguilar CHPRC	Print 	Sign	Date/Time JUN 04 2014 1030	Received By JC Fulton PRC	Print 	Sign	Date/Time JUN 04 2014 1030	Matrix *
Relinquished By JC Fulton CHPRC	Print 	Sign	Date/Time JUN 04 2014 1400	Received By H. Taylor PRC	Print 	Sign	Date/Time JUN 04 2014 0900	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By JC Fulton CHPRC	Print 	Sign	Date/Time JUN 04 2014 1400	Received By H. Taylor PRC	Print 	Sign	Date/Time JUN 04 2014 0900	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By JC Fulton CHPRC	Print 	Sign	Date/Time JUN 04 2014 1400	Received By H. Taylor PRC	Print 	Sign	Date/Time JUN 04 2014 0900	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time		
PRINTED ON 5/9/2014						A-6004-842 (REV 2)		

SAMPLE RECEIPT & REVIEW FORM

Client: <u>HUSA</u>		SDG/AR/COC/Work Order: <u>350049</u>	
Received By: <u>H. Taylor</u>		Date Received: <u>0620514</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <u>23</u> all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>13019660</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>7701 9274 8780-2</u> <u>9653 9095-2</u> <u>8997 8440-2</u> <u>9005 5008-3</u> <u>9274 8805-2</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: HMSA

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H h flags. 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
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely performed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Y	General Chemistry		Replaces J
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.	Y	Inorganics	Metals	Replaces B
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.	Y	General Chemistry		Replaces B
<	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 July 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	SC000122014-12
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

FID Diesel Range Organics Analysis

Case Narrative

**FID Diesel Range Organics
Hanford MSA (HMSA)
SDG GEL350049**

Method/Analysis Information

Procedure: Analysis of Diesel Range Organics by Flame Ionization Detector

Analytical Method: NWTPH-Dx

Prep Method: SW846 3535A

Analytical Batch Number: 1394524

Prep Batch Number: 1394519

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx:

Sample ID	Client ID
350049001	B2WRY2
350049003	B2WT06
350049014	B2WTC4
1203105456	Method Blank (MB)
1203105457	Laboratory Control Sample (LCS)
1203105458	350151008(B2WRX1) Matrix Spike (MS)
1203105459	350151008(B2WRX1) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

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-003 REV# 24.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

Initial Calibration

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

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

HMSA sample 350151008 (B2WRX1) of similar matrix in SDG GEL350151 was selected for the matrix spike and matrix spike duplicate analysis for this batch of the samples.

Matrix Spike (MS) Recovery Statement

The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD met the acceptance limits.

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. The samples extracted in this batch met the holding requirement.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Package Comment

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced

SOP or contractual documents.

Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL350049 GEL Work Order: 350049

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.

DL Indicates that sample is diluted.

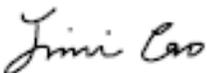
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Jimin Cao

Date: 27 JUN 2014

Title: Data Validator

Sample Data Summary

JULY 2, 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 X14-042

Report Date: June 17, 2014

Client Sample ID: B2WRY2
Lab Sample ID: 350049001
Matrix: WATER
Collect Date: 04-JUN-14 08:43
Receive Date: 05-JUN-14
Collector: Client
Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Row 1: Diesel Range Organics. Row 2: NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received". Row 3: TPH Diesel, U, ND, 48.5, 194, 194, ug/L, 1, BYT1, 06/12/14 00:38, 1394524 1.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row 1: SW846 3535A, 3535A DRO IN LIQ PREP, JXB6, 06/10/14, 0830, 1394519.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, NWTPH-Dx.

Table with 6 columns: Surrogate/Tracer recovery, Test, Result, Nominal, Recovery%, Acceptable Limits. Row 1: o-Terphenyl, NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received", 16.9 ug/L, 19.4, 86.9, (50%-150%).

JULY 2, 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 X14-042

Report Date: June 17, 2014

Client Sample ID: B2WT06
Lab Sample ID: 350049003
Matrix: WATER
Collect Date: 03-JUN-14 12:19
Receive Date: 05-JUN-14
Collector: Client
Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Row: Diesel Range Organics, NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received", TPH Diesel, U, ND, 48.5, 194, 194, ug/L, 1, BYT1, 06/12/14, 01:17, 1394524, 1.

The following Prep Methods were performed

Table with columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3535A, 3535A DRO IN LIQ PREP, JXB6, 06/10/14, 0830, 1394519.

The following Analytical Methods were performed

Table with columns: Method, Description, Analyst Comments. Row: 1, NWTPH-Dx.

Table with columns: Surrogate/Tracer recovery, Test, Result, Nominal, Recovery%, Acceptable Limits. Row: o-Terphenyl, NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received", 27.7 ug/L, 19.4, 143, (50%-150%).

JULY 2, 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 X14-042

Report Date: June 17, 2014

Client Sample ID: B2WTC4
Lab Sample ID: 350049014
Matrix: WATER
Collect Date: 04-JUN-14 09:59
Receive Date: 05-JUN-14
Collector: Client
Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Row 1: Diesel Range Organics. Row 2: NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received". Row 3: TPH Diesel, U, ND, 48.5, 194, 194, ug/L, 1, BYT1, 06/12/14, 01:56, 1394524, 1.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row 1: SW846 3535A, 3535A DRO IN LIQ PREP, JXB6, 06/10/14, 0830, 1394519.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, NWTPH-Dx.

Table with 6 columns: Surrogate/Tracer recovery, Test, Result, Nominal, Recovery%, Acceptable Limits. Row 1: o-Terphenyl, NWTPH-Dx DRO (WTPH_DIESEL:COMMON) "As Received", 15.6 ug/L, 19.4, 80.3, (50%-150%).

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 27, 2014

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1394524										
QC1203105457	LCS										
TPH Diesel	2000			1470	ug/L		73.7	(70%-130%)	BYT1	06/12/14	12:19
**o-Terphenyl	20.0			15.6	ug/L		78	(50%-150%)			
QC1203105456	MB										
TPH Diesel			U	ND	ug/L					06/11/14	17:28
**o-Terphenyl	20.0			14.7	ug/L		73.4	(50%-150%)			
QC1203105458	350151008	MS									
TPH Diesel	2000	U	ND	1470	ug/L		73.4	(70%-130%)		06/12/14	03:13
**o-Terphenyl	20.0		15.7	18.3	ug/L		91.5	(50%-150%)			
QC1203105459	350151008	MSD									
TPH Diesel	2000	U	ND	1640	ug/L	11.2	82.2	(0%-20%)		06/12/14	03:52
**o-Terphenyl	20.0		15.7	17.8	ug/L		89.1	(50%-150%)			

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

GEL LABORATORIES LLC

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QC Summary

Workorder: 350049

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

- o Analyte failed to recover within LCS limits (Organics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
 ^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.
 For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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

Metals Analysis

Case Narrative

**Metals Fractional Narrative
Hanford MSA (HMSA)
SDG GEL350049**

Sample Analysis

Sample ID	Client ID
350049001	B2WRY2
350049002	B2WRY1
350049003	B2WT06
350049004	B2WT05
350049005	B2WT72
350049006	B2WT73
350049007	B2WT81
350049008	B2WT82
350049009	B2WT90
350049010	B2WT91
350049011	B2WT99
350049012	B2WTB0
350049013	B2WTC3
350049014	B2WTC4
1203103509	Method Blank (MB) ICP
1203103510	Laboratory Control Sample (LCS)
1203103513	350049001(B2WRY2L) Serial Dilution (SD)
1203103511	350049001(B2WRY2S) Matrix Spike (MS)
1203103512	350049001(B2WRY2SD) Matrix Spike Duplicate (MSD)

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

Method/Analysis Information

Analytical Batch: 1393752
Prep Batch : 1393751
Standard Operating Procedures: GL-MA-E-013 REV# 22 and GL-MA-E-006 REV# 10
Analytical Method: 6010_METALS_ICP
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.

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 lead listed below. The sample concentrations were less than the MDL or greater than 2x the PQL, so the data is not adversely affected. 350049003 (B2WT06), 350049008 (B2WT82) and 350049014 (B2WTC4).

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 350049001 (B2WRY2).

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. All applicable analytes met the established acceptance percent difference criteria.

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. Sample required dilution for lead in order to minimize suppression due to matrix interferences. 350049010 (B2WT91).

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: Nick-Claudia Emore Date: 7.2.14

Sample Data Summary

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: GEL350049 GEL Work Order: 350049

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

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

D Results are reported from a diluted aliquot of sample.

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

Nick Cole A. Elmore 7.2.14

JULY 2, 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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WRY2
 Lab Sample ID: 350049001
 Matrix: WATER
 Collect Date: 04-JUN-14 08:43
 Receive Date: 05-JUN-14
 Collector: Client
 Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	19:45	1393752	1
Barium	B	11.8	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		16400	50.0	200	1000	ug/L	1					
Chromium	B	3.23	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron		290	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		4000	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		11100	100	300	500	ug/L	1					
Strontium		61.6	1.00	5.00	10.0	ug/L	1					
Vanadium	B	6.74	1.00	5.00	25.0	ug/L	1					
Antimony	B	4.37	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	14:31	1393752	2
Nickel	B	2.01	1.50	5.00	40.0	ug/L	1					
Potassium	B	900	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 2014

GEL LABORATORIES LLC

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Certificate of Analysis

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PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Report Date: July 2, 2014

Client Sample ID: B2WRY1
Lab Sample ID: 350049002
Matrix: WATER
Collect Date: 04-JUN-14 08:43
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Includes Metals Analysis-ICP data for various elements like Arsenic, Barium, Cadmium, etc.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows: 1, 6010_METALS_ICP; 2, 6010_METALS_ICP

JULY 2, 2014

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Certificate of Analysis

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Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT06
Lab Sample ID: 350049003
Matrix: WATER
Collect Date: 03-JUN-14 12:19
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Includes Metals Analysis-ICP data for various elements like Arsenic, Barium, Cadmium, etc.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows: 1, 6010_METALS_ICP; 2, 6010_METALS_ICP

JULY 2, 2014

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Address : MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT05
Lab Sample ID: 350049004
Matrix: WATER
Collect Date: 03-JUN-14 12:19
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Includes Metals Analysis-ICP data for various elements like Arsenic, Barium, Cadmium, etc.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows: 1, 6010_METALS_ICP; 2, 6010_METALS_ICP

JULY 2, 2014

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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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT72
 Lab Sample ID: 350049005
 Matrix: WATER
 Collect Date: 04-JUN-14 08:40
 Receive Date: 05-JUN-14
 Collector: Client

Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:17	1393752	1
Barium	B	14.5	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		17800	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		3950	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		4080	100	300	500	ug/L	1					
Strontium		70.0	1.00	5.00	10.0	ug/L	1					
Vanadium	B	1.43	1.00	5.00	25.0	ug/L	1					
Antimony	B	4.27	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:02	1393752	2
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	938	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 2014

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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT73
 Lab Sample ID: 350049006
 Matrix: WATER
 Collect Date: 04-JUN-14 08:40
 Receive Date: 05-JUN-14
 Collector: Client

Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:20	1393752	1
Barium	B	14.4	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		17700	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		3920	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		4010	100	300	500	ug/L	1					
Strontium		70.5	1.00	5.00	10.0	ug/L	1					
Vanadium	B	1.52	1.00	5.00	25.0	ug/L	1					
Antimony	B	5.75	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:05	1393752	2
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	955	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 2014

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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT81
 Lab Sample ID: 350049007
 Matrix: WATER
 Collect Date: 04-JUN-14 09:41
 Receive Date: 05-JUN-14
 Collector: Client
 Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	B	7.18	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:24	1393752	1
Barium		25.6	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		30600	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		5310	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		3580	100	300	500	ug/L	1					
Strontium		123	1.00	5.00	10.0	ug/L	1					
Vanadium	B	2.47	1.00	5.00	25.0	ug/L	1					
Antimony	B	6.14	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:08	1393752	2
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	1340	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT82
 Lab Sample ID: 350049008
 Matrix: WATER
 Collect Date: 04-JUN-14 09:41
 Receive Date: 05-JUN-14
 Collector: Client

Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	B	5.07	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:27	1393752	1
Barium		24.8	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		29800	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Magnesium		5180	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		3440	100	300	500	ug/L	1					
Strontium		122	1.00	5.00	10.0	ug/L	1					
Vanadium	B	2.25	1.00	5.00	25.0	ug/L	1					
Antimony	U	ND	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:11	1393752	2
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	1330	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 2014

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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT90
 Lab Sample ID: 350049009
 Matrix: WATER
 Collect Date: 04-JUN-14 10:41
 Receive Date: 05-JUN-14
 Collector: Client

Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:31	1393752	1
Barium		29.7	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		32400	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		5910	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		3300	100	300	500	ug/L	1					
Strontium		141	1.00	5.00	10.0	ug/L	1					
Vanadium	B	2.36	1.00	5.00	25.0	ug/L	1					
Antimony	U	ND	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:14	1393752	2
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	1460	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT91
Lab Sample ID: 350049010
Matrix: WATER
Collect Date: 04-JUN-14 10:41
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Includes Metals Analysis-ICP and 6010_METALS_ICP: COMMON +GW 05 "As Received" data.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows: 1, 6010_METALS_ICP; 2, 6010_METALS_ICP; 3, 6010_METALS_ICP

JULY 2, 2014

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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WT99
 Lab Sample ID: 350049011
 Matrix: WATER
 Collect Date: 04-JUN-14 11:40
 Receive Date: 05-JUN-14
 Collector: Client
 Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:37	1393752	1
Barium	B	18.9	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		18100	50.0	200	1000	ug/L	1					
Chromium	U	ND	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron		50.7	30.0	100	50.0	ug/L	1					
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Magnesium		4150	110	300	750	ug/L	1					
Manganese	B	3.11	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		2600	100	300	500	ug/L	1					
Strontium		86.5	1.00	5.00	10.0	ug/L	1					
Vanadium	B	1.67	1.00	5.00	25.0	ug/L	1					
Antimony	U	ND	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:20	1393752	2
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	915	50.0	150	4000	ug/L	1					
Zinc	B	6.28	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

JULY 2, 2014

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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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WTB0
Lab Sample ID: 350049012
Matrix: WATER
Collect Date: 04-JUN-14 11:40
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Includes Metals Analysis-ICP data for various elements like Arsenic, Barium, Cadmium, etc.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows: 1, 6010_METALS_ICP; 2, 6010_METALS_ICP

JULY 2, 2014

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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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WTC3
Lab Sample ID: 350049013
Matrix: WATER
Collect Date: 04-JUN-14 09:49
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Contains data for Metals Analysis-ICP with various elements like Arsenic, Barium, Cadmium, etc.

The following Prep Methods were performed

Table with 6 columns: Method, Description, Analyst, Date, Time, Prep Batch. Row 1: SW846 3005A, SW846 3005A for 6010C, JXM5, 06/12/14, 0730, 1393751

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 6010_METALS_ICP, Row 2: 2, 6010_METALS_ICP

JULY 2, 2014

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 X14-042**

Report Date: July 2, 2014

Client Sample ID: B2WTC4
 Lab Sample ID: 350049014
 Matrix: WATER
 Collect Date: 04-JUN-14 09:59
 Receive Date: 05-JUN-14
 Collector: Client

Project: HMSA00163
 Client ID: HMSA001
 Client SDG: GEL350049

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON +GW 05 "As Received"</i>												
Arsenic	U	ND	5.00	30.0	100	ug/L	1	HSC	06/26/14	20:49	1393752	1
Barium	B	16.9	1.00	5.00	20.0	ug/L	1					
Cadmium	U	ND	1.00	5.00	5.00	ug/L	1					
Calcium		18800	50.0	200	1000	ug/L	1					
Chromium	B	1.50	1.00	5.00	10.0	ug/L	1					
Cobalt	U	ND	1.00	5.00	20.0	ug/L	1					
Copper	U	ND	3.00	10.0	10.0	ug/L	1					
Iron	U	ND	30.0	100	50.0	ug/L	1					
Magnesium		4480	110	300	750	ug/L	1					
Manganese	U	ND	2.00	10.0	5.00	ug/L	1					
Molybdenum	U	ND	2.00	10.0	10.0	ug/L	1					
Silver	U	ND	1.00	5.00	10.0	ug/L	1					
Sodium		3420	100	300	500	ug/L	1					
Strontium		84.4	1.00	5.00	10.0	ug/L	1					
Vanadium	B	1.20	1.00	5.00	25.0	ug/L	1					
Antimony	U	ND	3.50	10.0	60.0	ug/L	1	HSC	06/27/14	15:29	1393752	2
Lead	U	ND	3.30	10.0	10.0	ug/L	1					
Nickel	U	ND	1.50	5.00	40.0	ug/L	1					
Potassium	B	1020	50.0	150	4000	ug/L	1					
Zinc	U	ND	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	JXM5	06/12/14	0730	1393751

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	6010_METALS_ICP	
2	6010_METALS_ICP	

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 2, 2014

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 350049

Parmname	NOM	Sample Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP										
Batch	1393752									
QC1203103510	LCS									
Antimony	500		511	ug/L		102	(80%-120%)	HSC	06/27/14	14:28
Arsenic	500		508	ug/L		102	(80%-120%)		06/26/14	19:42
Barium	500		517	ug/L		103	(80%-120%)			
Cadmium	500		513	ug/L		103	(80%-120%)			
Calcium	5000		5190	ug/L		104	(80%-120%)			
Chromium	500		515	ug/L		103	(80%-120%)			
Cobalt	500		515	ug/L		103	(80%-120%)			
Copper	500		500	ug/L		100	(80%-120%)			
Iron	5000		5280	ug/L		106	(80%-120%)			
Lead	500		520	ug/L		104	(80%-120%)			
Magnesium	5000		5400	ug/L		108	(80%-120%)			
Manganese	500		518	ug/L		104	(80%-120%)			
Molybdenum	500		511	ug/L		102	(80%-120%)			
Nickel	500		524	ug/L		105	(80%-120%)		06/27/14	14:28
Potassium	5000		5170	ug/L		103	(80%-120%)			
Silver	500		509	ug/L		102	(80%-120%)		06/26/14	19:42
Sodium	5000		5450	ug/L		109	(80%-120%)			
Strontium	500		517	ug/L		103	(80%-120%)			
Vanadium	500		532	ug/L		106	(80%-120%)			
Zinc	500		510	ug/L		102	(80%-120%)		06/27/14	14:28

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QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1393752										
QC1203103509		MB									
Antimony			B	5.51	ug/L				HSC	06/27/14	14:24
Arsenic			U	ND	ug/L					06/26/14	19:38
Barium			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						
Lead			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Manganese			U	ND	ug/L						
Molybdenum			U	ND	ug/L						
Nickel			U	ND	ug/L					06/27/14	14:24
Potassium			U	ND	ug/L						
Silver			U	ND	ug/L					06/26/14	19:38
Sodium			U	ND	ug/L						
Strontium			U	ND	ug/L						
Vanadium			U	ND	ug/L						
Zinc			U	ND	ug/L					06/27/14	14:24
QC1203103511		350049001	MS								
Antimony	500	B	4.37	505	ug/L		100	(75%-125%)		06/27/14	14:34

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QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1393752										
Arsenic	500	U	ND	510	ug/L		101	(75%-125%)	HSC	06/26/14	19:49
Barium	500	B	11.8	524	ug/L		102	(75%-125%)			
Cadmium	500	U	ND	503	ug/L		101	(75%-125%)			
Calcium	5000		16400	21800	ug/L		108	(75%-125%)			
Chromium	500	B	3.23	513	ug/L		102	(75%-125%)			
Cobalt	500	U	ND	503	ug/L		101	(75%-125%)			
Copper	500	U	ND	504	ug/L		101	(75%-125%)			
Iron	5000		290	5370	ug/L		102	(75%-125%)			
Lead	500	U	ND	502	ug/L		100	(75%-125%)			
Magnesium	5000		4000	9280	ug/L		106	(75%-125%)			
Manganese	500	U	ND	513	ug/L		102	(75%-125%)			
Molybdenum	500	U	ND	512	ug/L		102	(75%-125%)			
Nickel	500	B	2.01	506	ug/L		101	(75%-125%)		06/27/14	14:34
Potassium	5000	B	900	5950	ug/L		101	(75%-125%)			
Silver	500	U	ND	510	ug/L		102	(75%-125%)		06/26/14	19:49
Sodium	5000		11100	16700	ug/L		112	(75%-125%)			
Strontium	500		61.6	574	ug/L		103	(75%-125%)			
Vanadium	500	B	6.74	540	ug/L		107	(75%-125%)			
Zinc	500	U	ND	499	ug/L		99.5	(75%-125%)		06/27/14	14:34
QC1203103512	350049001	MSD									
Antimony	500	B	4.37	510	ug/L	0.832	101	(0%-20%)		06/27/14	14:38
Arsenic	500	U	ND	509	ug/L	0.216	101	(0%-20%)		06/26/14	19:52

GEL LABORATORIES LLC

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

QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1393752										
Barium	500	B	11.8	522	ug/L	0.363	102	(0%-20%)	HSC	06/26/14	19:52
Cadmium	500	U	ND	501	ug/L	0.340	100	(0%-20%)			
Calcium	5000		16400	21700	ug/L	0.777	105	(0%-20%)			
Chromium	500	B	3.23	512	ug/L	0.172	102	(0%-20%)			
Cobalt	500	U	ND	501	ug/L	0.303	100	(0%-20%)			
Copper	500	U	ND	506	ug/L	0.377	101	(0%-20%)			
Iron	5000		290	5430	ug/L	1.14	103	(0%-20%)			
Lead	500	U	ND	505	ug/L	0.711	101	(0%-20%)			
Magnesium	5000		4000	9290	ug/L	0.166	106	(0%-20%)			
Manganese	500	U	ND	514	ug/L	0.204	102	(0%-20%)			
Molybdenum	500	U	ND	514	ug/L	0.427	103	(0%-20%)			
Nickel	500	B	2.01	515	ug/L	1.77	103	(0%-20%)		06/27/14	14:38
Potassium	5000	B	900	6050	ug/L	1.74	103	(0%-20%)			
Silver	500	U	ND	512	ug/L	0.432	102	(0%-20%)		06/26/14	19:52
Sodium	5000		11100	16800	ug/L	0.489	114	(0%-20%)			
Strontium	500		61.6	580	ug/L	0.927	104	(0%-20%)			
Vanadium	500	B	6.74	540	ug/L	0.00	107	(0%-20%)			
Zinc	500	U	ND	507	ug/L	1.56	101	(0%-20%)		06/27/14	14:38
QC1203103513 350049001 SDILT											
Antimony		B	4.37	DU	ND	ug/L	N/A	(0%-10%)		06/27/14	14:41
Arsenic		U	ND	DU	ND	ug/L	N/A	(0%-10%)		06/26/14	19:56
Barium		B	11.8	D	2.36	ug/L	.0465	(0%-10%)			

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QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1393752										
Cadmium	U	ND	DU	ND	ug/L	N/A		(0%-10%)	HSC	06/26/14	19:56
Calcium		16400	D	3240	ug/L	1.41		(0%-10%)			
Chromium	B	3.23	DU	ND	ug/L	N/A		(0%-10%)			
Cobalt	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Copper	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Iron		290	D	55.7	ug/L	3.88		(0%-10%)			
Lead	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Magnesium		4000	D	826	ug/L	3.28		(0%-10%)			
Manganese	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Molybdenum	U	ND	DU	ND	ug/L	N/A		(0%-10%)			
Nickel	B	2.01	DU	ND	ug/L	N/A		(0%-10%)		06/27/14	14:41
Potassium	B	900	D	193	ug/L	7.18		(0%-10%)			
Silver	U	ND	DU	ND	ug/L	N/A		(0%-10%)		06/26/14	19:56
Sodium		11100	D	2230	ug/L	.31		(0%-10%)			
Strontium		61.6	D	12.4	ug/L	.232		(0%-10%)			
Vanadium	B	6.74	D	1.45	ug/L	7.6		(0%-10%)			
Zinc	U	ND	DU	ND	ug/L	N/A		(0%-10%)		06/27/14	14:41

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

GEL LABORATORIES LLC

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

QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
C	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.										
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 GEL350049**

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1393583 **Method:** 9056_ANIONS_IC: COMMON + GW 01

Sample Analysis

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

Sample ID	Client ID
350049015	B2WT92
350049016	B2WTB1
350049017	B2WT07
350049018	B2WRY3
350049019	B2WT74
350049020	B2WT83
350049021	B2WTC5
1203103063	Method Blank (MB)
1203103064	350049021(B2WTC5) Sample Duplicate (DUP)
1203103065	350046005(B2WMD9) Sample Duplicate (DUP)
1203103066	350049021(B2WTC5) Post Spike (PS)
1203103067	350046005(B2WMD9) Post Spike (PS)
1203103068	Laboratory Control Sample (LCS)

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# 22.

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 350046005 (B2WMD9) and 350049021 (B2WTC5).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

The following sample from this sample group was logged in for this analysis outside of the method specified holding time: 350049018 (B2WRY3).

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 350049015 (B2WT92), 350049017 (B2WT07) and 350049018 (B2WRY3).

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: 1302145. 350049018 (B2WRY3).

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203103064 (B2WTC5), 1203103065 (B2WMD9), 1203103066 (B2WTC5), 350049015 (B2WT92), 350049016 (B2WTB1), 350049017 (B2WT07), 350049018 (B2WRY3), 350049019 (B2WT74), 350049020 (B2WT83) and 350049021 (B2WTC5).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

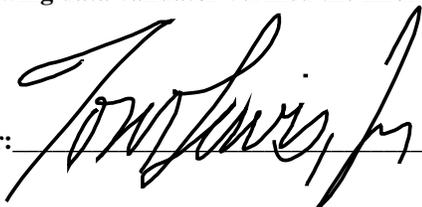
Certification Statement

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

Review Validation:

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

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

Reviewer:  Date: 02July14

Sample Data Summary

GEL LABORATORIES LLC

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

**Certificate of Analysis Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL350049 GEL Work Order: 350049

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



JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT92
Lab Sample ID: 350049015
Matrix: WATER
Collect Date: 04-JUN-14 10:41
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Rows include Chloride, Fluoride, Nitrate-N, Nitrite-N, Phosphorus in phosphate, Sulfate.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows 1 and 2 describe SW846 9056A.

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WTB1
Lab Sample ID: 350049016
Matrix: WATER
Collect Date: 04-JUN-14 11:40
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Rows include Chloride, Fluoride, Nitrate-N, Nitrite-N, Phosphorus in phosphate, Sulfate.

The following Analytical Methods were performed

Table with columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9056A

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT07
Lab Sample ID: 350049017
Matrix: WATER
Collect Date: 03-JUN-14 12:19
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Rows include Chloride, Fluoride, Nitrite-N, Phosphorus in phosphate, Nitrate-N, Sulfate.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows 1 and 2 describe SW846 9056A.

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WRY3
Lab Sample ID: 350049018
Matrix: WATER
Collect Date: 04-JUN-14 08:43
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Rows include Chloride, Fluoride, Nitrate-N, Nitrite-N, Sulfate, and Phosphorus in phosphate.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Rows 1 and 2 describe SW846 9056A.

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT74
Lab Sample ID: 350049019
Matrix: WATER
Collect Date: 04-JUN-14 08:40
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Rows include Chloride, Fluoride, Nitrate-N, Nitrite-N, Phosphorus in phosphate, Sulfate.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9056A

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WT83
Lab Sample ID: 350049020
Matrix: WATER
Collect Date: 04-JUN-14 09:41
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Rows include Chloride, Fluoride, Nitrate-N, Nitrite-N, Phosphorus in phosphate, Sulfate.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9056A

JULY 2, 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 X14-042

Report Date: July 2, 2014

Client Sample ID: B2WTC5
Lab Sample ID: 350049021
Matrix: WATER
Collect Date: 04-JUN-14 09:59
Receive Date: 05-JUN-14
Collector: Client
Project: HMSA00163
Client ID: HMSA001
Client SDG: GEL350049

Table with columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Includes Ion Chromatography data for Chloride, Fluoride, Nitrate-N, Nitrite-N, Phosphorus in phosphate, and Sulfate.

The following Analytical Methods were performed

Table with columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9056A

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 2, 2014

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1393583										
QC1203103064	350049021	DUP									
Chloride		1110		1120	ug/L	1.02		(0%-20%)	DM	06/06/14	02:34
Fluoride	B	70.3	B	68.4	ug/L	2.74	^	(+/-500)			
Nitrate-N	B	236	B	227	ug/L	3.63	^	(+/-250)			
Nitrite-N	U	ND	U	ND	ug/L	N/A					
Phosphorus in phosphate	B	375	B	383	ug/L	2.09	^	(+/-500)			
Sulfate		7710		7720	ug/L	0.188		(0%-20%)			
QC1203103065	350046005	DUP									
Chloride	B	77.2	U	ND	ug/L	17.0	^	(+/-200)		06/05/14	19:51
Fluoride	U	ND	U	ND	ug/L	N/A					
Nitrate-N	U	ND	U	ND	ug/L	N/A					
Nitrite-N	U	ND	U	ND	ug/L	N/A					
Phosphorus in phosphate	U	ND	U	ND	ug/L	N/A					
Sulfate	U	ND	U	ND	ug/L	N/A					
QC1203103068	LCS										
Chloride	5000			4790	ug/L			95.8 (90%-110%)		06/06/14	04:07
Fluoride	2500			2460	ug/L			98.5 (90%-110%)			
Nitrate-N	2500			2410	ug/L			96.5 (90%-110%)			
Nitrite-N	2500			2420	ug/L			96.9 (90%-110%)			
Phosphorus in phosphate	1250			1290	ug/L			103 (90%-110%)			
Sulfate	10000			9770	ug/L			97.7 (90%-110%)			
QC1203103063	MB										

GEL LABORATORIES LLC

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QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1393583										
Chloride			U	ND	ug/L					06/06/14	03:36
Fluoride			U	ND	ug/L				DM		
Nitrate-N			U	ND	ug/L						
Nitrite-N			U	ND	ug/L						
Phosphorus in phosphate			U	ND	ug/L						
Sulfate			U	ND	ug/L						
QC1203103066 350049021 PS											
Chloride	5.00			1.11	6.00	mg/L	97.8	(90%-110%)		06/06/14	03:05
Fluoride	2.50	B		0.0703	2.47	mg/L	96.2	(90%-110%)			
Nitrate-N	2.50	B		0.236	2.67	mg/L	97.3	(90%-110%)			
Nitrite-N	2.50	U		ND	2.43	mg/L	97.1	(90%-110%)			
Phosphorus in phosphate	1.25	B		0.375	1.64	mg/L	101	(90%-110%)			
Sulfate	10.0			7.71	18.2	mg/L	105	(90%-110%)			
QC1203103067 350046005 PS											
Chloride	5.00	B		0.0772	4.75	mg/L	93.4	(90%-110%)		06/05/14	20:22
Fluoride	2.50	U		ND	2.45	mg/L	97.9	(90%-110%)			
Nitrate-N	2.50	U		ND	2.42	mg/L	96.9	(90%-110%)			
Nitrite-N	2.50	U		ND	2.44	mg/L	97.6	(90%-110%)			
Phosphorus in phosphate	1.25	U		ND	1.30	mg/L	104	(90%-110%)			
Sulfate	10.0	U		ND	9.82	mg/L	98.2	(90%-110%)			

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range

GEL LABORATORIES LLC

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

QC Summary

Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).										
C	Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.										
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. 09-JUN-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1393583	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 350046(GEL350046),350049(GEL350049)			
Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: 350046 006,007,008 350049 018		1. The initial runs for the samples were in holding, but the holding time had expired prior to diluted runs.	

Originator's Name:

Dustin Miller 09-JUN-14

Data Validator/Group Leader:

Thomas Lewis 01-JUL-14

Radiological Analysis

**Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL350049
Work Order 350049**

Method/Analysis Information

Product: 9310_ALPHABETA_GPC: COMMON

Analytical Method: BETA_GPC

Analytical Batch Number: 1394066

Sample ID	Client ID
350049001	B2WRY2
350049003	B2WT06
350049006	B2WT73
350049008	B2WT82
350049010	B2WT91
350049012	B2WTB0
350049014	B2WTC4
1203104266	Method Blank (MB)
1203104267	350049001(B2WRY2) Sample Duplicate (DUP)
1203104268	350049001(B2WRY2) Matrix Spike (MS)
1203104269	350049001(B2WRY2) Matrix Spike Duplicate (MSD)
1203104270	Laboratory Control Sample (LCS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 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: 350049001 (B2WRY2).

QC Information

All of the QC samples met the required acceptance limits.

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

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

Chemical Recoveries

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

Gross Alpha/Beta Preparation Information

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

Recounts

Sample 1203104270 (LCS) was recounted due to high recovery. The recount is reported. Sample 1203104266 (MB) was recounted due to high MDC. The recount is reported. Samples 1203104267 (B2WRY2), 350049001 (B2WRY2), 350049006 (B2WT73), 350049008 (B2WT82), 350049010 (B2WT91) and 350049012 (B2WTB0) were recounted to verify sample results. The second counts 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

The matrix spike and matrix spike duplicate, 1203104268 (B2WRY2) and 1203104269 (B2WRY2), aliquots were reduced to conserve sample volume. Samples 1203104267 (B2WRY2), 350049006 (B2WT73) and 350049008 (B2WT82) have a negative result that is greater than the 3 sigma TPU. The background control charts were examined and the detectors were determined to be fully functional.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: SRTOT_SEP_PRECIP_GPC: COMMON

Analytical Method: SRTOT_SEP_PRECIP_GPC

Analytical Batch Number: 1395487

Sample ID	Client ID
350049001	B2WRY2
350049003	B2WT06
350049006	B2WT73
350049008	B2WT82
350049010	B2WT91
350049012	B2WTB0
350049014	B2WTC4
1203108038	Method Blank (MB)
1203108039	350129001(B2WF36) Sample Duplicate (DUP)
1203108040	Laboratory Control Sample (LCS)

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: 350129001 (B2WF36).

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Strontium-90 RER is above 2 at 2.57. Both the sample and duplicate in this batch have results less than MDC. 1203108039 (B2WF36).

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 1203108040 (LCS) was recounted due to high recovery. The recount is reported. Sample 350049014 (B2WTC4) was recounted due to high MDC. The recount is reported. Sample 1203108039 (B2WF36) was recounted due to high relative percent difference/relative error ratio. 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.

Certification Statement

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

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL350049 GEL Work Order: 350049

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Theresa Austin

Date: 26 JUN 2014

Title: Group Leader

Sample Data Summary

JULY 2, 2014

GEL LABORATORIES LLC

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

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 X14-042

Report Date: June 26, 2014

Client Sample ID: B2WRY2
Sample ID: 350049001
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with 14 columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC data.

The following Analytical Methods were performed

Table with 2 columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with 5 columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 81.7, (25%-125%)

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

JULY 2, 2014

GEL LABORATORIES LLC

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

Certificate of Analysis

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

Report Date: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WT06
Sample ID: 350049003
Matrix: WATER
Collect Date: 03-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC data.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 87.8, (25%-125%)

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

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Richland, Washington 99352

Report Date: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WT73
Sample ID: 350049006
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC: COMMON "As Received" data.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 87.8, (25%-125%)

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

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Report Date: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WT82
Sample ID: 350049008
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC data.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 84.1, (25%-125%)

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

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PO Box 1600
Richland, Washington 99352

Report Date: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WT91
Sample ID: 350049010
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC: COMMON "As Received" data.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 82.9, (25%-125%)

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

JULY 2, 2014

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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: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WTB0
Sample ID: 350049012
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting results for Alpha, Beta, and Total Strontium.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310; 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 87.8, (25%-125%)

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

JULY 2, 2014

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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: June 26, 2014

Contact: Mr. Scot Fitzgerald
Project: CHPRC SAF X14-042

Client Sample ID: B2WTC4
Sample ID: 350049014
Matrix: WATER
Collect Date: 04-JUN-14
Receive Date: 05-JUN-14
Collector: Client

Project: HMSA00163
Client ID: HMSA001

Table with columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Rad Gas Flow Proportional Counting and SRTOT_SEP_PRECIP_GPC: COMMON "As Received" data.

The following Analytical Methods were performed

Table with columns: Method, Description. Rows 1: EPA 900.0/SW846 9310, 2: EPA 905.0 Modified

Table with columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Strontium Carrier, SRTOT_SEP_PRECIP_GPC: COMMON "As Received", 1395487, 84.1, (25%-125%)

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

Quality Control Data

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 26, 2014

Page 1 of 3

Client : CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 350049

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	1394066								
QC1203104266	MB								
Alpha			U	0.659	pCi/L			BXF1	06/18/1408:54
				Uncert: +/-1.28					
				TPU: +/-1.29					
Beta			U	0.811	pCi/L				
				Uncert: +/-1.76					
				TPU: +/-1.77					
QC1203104267	350049001	DUP							
Alpha		U	-2.01	U	-2.54	pCi/L			06/18/1408:54
			Uncert: +/-1.71		+/-1.23		RPD: 0	N/A	
			TPU: +/-1.72		+/-1.23		RER: 0.489	(0-2)	
Beta			334		326	pCi/L			
			Uncert: +/-10.7		+/-9.66		RPD: 2	(0% - 20%)	
			TPU: +/-56.8		+/-53.7		RER: 0.202	(0-2)	
QC1203104268	350049001	MS							
Alpha		165	U	-2.01	196	pCi/L	REC: 119	(75%-125%)	06/17/1411:49
				Uncert: +/-1.71	+/-18.1				
				TPU: +/-1.72	+/-38.2				
Beta		603		334	1020	pCi/L	REC: 114	(75%-125%)	
				Uncert: +/-10.7	+/-29.6				
				TPU: +/-56.8	+/-169				
QC1203104269	350049001	MSD							
Alpha		165	U	-2.01	199	pCi/L	REC: 121	(75%-125%)	06/17/1411:49
				Uncert: +/-1.71	+/-18.9		RPD: 1	(0%-20%)	
				TPU: +/-1.72	+/-38.5		RER: 0.0899	(0-2)	
Beta		603		334	1010	pCi/L	REC: 111	(75%-125%)	
				Uncert: +/-10.7	+/-29.6		RPD: 2	(0%-20%)	
				TPU: +/-56.8	+/-166		RER: 0.128	(0-2)	
QC1203104270	LCS								
Alpha		82.3			88.3	pCi/L	REC: 107	(80%-120%)	06/18/1411:39
				Uncert: +/-8.47					
				TPU: +/-17.6					
Beta		302			335	pCi/L	REC: 111	(80%-120%)	
				Uncert: +/-12.2					
				TPU: +/-57.0					
Batch	1395487								
QC1203108038	MB								
Total Strontium				U	0.110	pCi/L		KSD1	06/22/1411:21
					Uncert: +/-0.888				
					TPU: +/-0.888				
QC1203108039	350129001	DUP							
Total Strontium		U	-0.604	U	1.00	pCi/L			06/24/1415:41
			Uncert: +/-0.721		+/-0.859		RPD: 0	N/A	
			TPU: +/-0.722		+/-0.892		RER: 2.75	(0-2)	
QC1203108040	LCS								

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QC Summary

Workorder: 350049

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
Rad Gas Flow										
Batch	1395487									
Total Strontium	113			130	pCi/L	REC: 115	(80%-120%)			
	Uncert:			+/-6.10						
	TPU:			+/-31.0						

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, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- E Reported value is estimated due to interferences. See comment in narrative.
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- S Reported value determined by the Method of Standard Additions (MSA)
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (Organics only)

JULY 2, 2014

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QC Summary

Workorder: 350049

Page 3 of 3

<u>Parmname</u>	<u>NOM</u>	<u>Sample</u>	<u>Qual</u>	<u>QC</u>	<u>Units</u>	<u>QC Criteria</u>	<u>Range</u>	<u>Analyst</u>	<u>Date</u>	<u>Time</u>
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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.

** 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.