GEL Laboratories LLC
a member of The GEL Group INC

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

August 08, 2016

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

Re: CHPRC SAF A16-006
Work Order: 401492
SDG: GEL401492

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 13, 2016. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

B. Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071JDBA - 7H
Chain of Custody: A16-006-019 and A16-006-021
Enclosures

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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF A16-006
SDG: GEL401492

August 08, 2016

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on July 13, 2016, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER.

Sample Identification
The laboratory received the following samples:

Laboratory Identification	Sample Description
401492001	B35RM1
401492002	B35RM9

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: Metals and Radiochemistry.

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

B. Luthman

Brielle Luthman for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401492
Work Order #: 401492

Metals

Determination of Metals by ICP-MS

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

Radiochemistry

I129LL_SEP_LEPS_GS: COMMON (low level)

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

TC99_EIE_LSC: COMMON

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

Technical Information

Recounts
Samples 1203585993 (Non SDG 400884001DUP) and 401492002 (B35RM9) were recounted to verify sample results. Recounts are reported.

TRITIUM_DIST_LSC: COMMON

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

Certification Statement

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

Chain of Custody and Supporting Documentation

80 lbs

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

401492

C.O.C. # A16-006-019

Page 1 of 1

Collector	Frank Hall /CHPRC	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	A16-006	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071
Project Title	LLWMA-1 AND LLWMA-4 PA, JULY	Logbook No.	HNF-N-506 85 / 88/89	Ice Chest No.	GWS-459
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7767 1251 3125
Protocol	SURV	Priority:	30 Days PRIORITY	Offsite Property No.	6812

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 ☐

N/A

Special Handling:N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35RM1	N	W	7/10/16	1229	1x500-mL G/P	6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B35RM1	N	W	↓	↓	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35RM1	N	W			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35RM1	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

8/9/2016

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Frank Hall /CHPRC			JUL 10 2016 1530	SSU #1			JUL 10 2016 1530
SSU #1			JUL 11 2016 0730	Lesly Wall /CHPRC		Lesly Wall	JUL 11 2016 0730
Lesly Wall /CHPRC		Lesly Wall	JUL 11 2016 1400	FEDEX			
				M Kirslow			7-13-16 0910

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 5/26/2016 FSR ID = FSR12104 A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

401492

C.O.C. # **A16-006-021**

Page 1 of 1

Collector	Frank Hall /CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	A16-006	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	300071
Project Title	LLWMA-1 AND LLWMA-4 PA, JULY	**Logbook No.**	HNF-N-506 85 / 88/89	**Ice Chest No.**	GW5-459
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7767 1251 3125
Protocol	SURV	**Priority:**	**30 Days** **PRIORITY**	**Offsite Property No.**	6812

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 ☐

N/A

Special Handling:N/A

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B35RM9	N	W	7/10/16	1402	1x500-mL G/P	6020_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B35RM9	N	W	↓	↓	2x4-L G/P	I129LL_SEP_LEPS_GS_LL: COMMON	6 Months	None
B35RM9	N	W			1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B35RM9	N	W			1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

LW. 7/10/16 1530

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Frank Hall /CHPRC			JUL 10 2016 ~~1400~~	SSU#1			JUL 10 2016 1530
SSU#1			JUL 11 2016 0730	Lesly Wall /CHPRC		Lesly Wall	JUL 11 2016 0730
Lesly Wall /CHPRC		Lesly Wall	JUL 11 2016 1400	FEDEX			
FX				M. Kinslow			7-13-16 0910

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 5/26/2016 FSR ID = FSR10281 A-6004-842 (REV 2)

8/9/2016

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CPRG	**SDG/AR/COC/Work Order:** 401492
Received By: MC	**Date Received:** 7-13-16

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): cpm 0
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Ice bags Blue ice Dry ice (None) Other (describe) *all temperatures are recorded in Celsius 18C 19C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130462962 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials contain acid preservation?		✓		(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 7767 1251 3125 18C 7767 2444 7216 19C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials BL Date 7·13·16 Page 1 of 1

GL-CHL-SR-001 Rev 3

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 08−AUG−16

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
J	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol−condensation product	Organics	Semi−Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (0rganics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post−digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
B	The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy−−Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 08 August 2016

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401492
Work Order #: 401492

Product: **Determination of Metals by ICP-MS**
Analytical Method: 6020_METALS_ICPMS
Analytical Procedure: GL-MA-E-014 REV# 28
Analytical Batch: 1581621

Preparation Method: SW846 3005A
Preparation Procedure: GL-MA-E-006 REV# 13
Preparation Batch: 1581620

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

GEL Sample ID#	Client Sample Identification
401492001	B35RM1
401492002	B35RM9
1203584552	Method Blank (MB)**ICP-MS**
1203584553	Laboratory Control Sample (LCS)
1203584556	401492001(B35RM1L) Serial Dilution (SD)
1203584554	401492001(B35RM1S) Matrix Spike (MS)
1203584555	401492001(B35RM1SD) Matrix Spike Duplicate (MSD)

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

Data Summary:

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401492 GEL Work Order: 401492

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.

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: Nik-Cole A. Elmore **Name: Nik-Cole Elmore**

Date: 09 AUG 2016 **Title: Data Validator**

Sample Data Summary

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL401492 **CONTRACT:** CPRC0A16006 **METHOD TYPE:** SW846

SAMPLE ID: 401492001 **BASIS:** As Received **DATE COLLECTED** 10−JUL−16

CLIENT ID: B35RM1 **LEVEL:** Low **DATE RECEIVED** 13−JUL−16

MATRIX: WATER **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−61−1	Uranium	0.845	ug/L		0.067	0.2	15	1	MS	BAJ	07/20/16 16:06	160720−1	1581621

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1581621	1581620	SW846 3005A	50	mL	50	mL	07/13/16	JP1

***Analytical Methods:**

MS **SW846 3005A/6020A**

GEL Laboratories LLC

METALS
−1−
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL401492 **CONTRACT:** CPRC0A16006 **METHOD TYPE:** SW846

SAMPLE ID: 401492002 **BASIS:** As Received **DATE COLLECTED** 10−JUL−16

CLIENT ID: B35RM9 **LEVEL:** Low **DATE RECEIVED** 13−JUL−16

MATRIX: WATER **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440−61−1	Uranium	0.969	ug/L		0.067	0.2	15	1	MS	BAJ	07/20/16 16:12	160720−1	1581621

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1581621	1581620	SW846 3005A	50	mL	50	mL	07/13/16	JP1

***Analytical Methods:**

MS **SW846 3005A/6020A**

Quality Control Summary

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

QC Summary

Report Date: August 9, 2016

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **401492**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS										
Batch 1581621										
QC1203584553 LCS										
Uranium	50.0			50.6	ug/L		101	(80%-120%)	BAJ	07/20/16 16:05
QC1203584552 MB										
Uranium			U	0.067	ug/L					07/20/16 16:04
QC1203584554 401492001 MS										
Uranium	50.0	0.845		50.8	ug/L		99.8	(75%-125%)		07/20/16 16:08
QC1203584555 401492001 MSD										
Uranium	50.0	0.845		51.8	ug/L	2.03	102	(0%-20%)		07/20/16 16:09
QC1203584556 401492001 SDILT										
Uranium		0.845	BD	0.171	ug/L	1.18		(0%-10%)		07/20/16 16:10

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

QC Summary

Workorder: **401492**

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

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

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

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL401492
Work Order #: 401492

Product: **I129LL_SEP_LEPS_GS: COMMON (low level)**
Analytical Method: DOE EML HASL-300,I-01 Modified
Analytical Procedure: GL-RAD-A-006 REV# 21
Analytical Batch: 1581778

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

GEL Sample ID#	Client Sample Identification
401492001	B35RM1
401492002	B35RM9
1203584985	Method Blank (MB)
1203584986	401492001(B35RM1) Sample Duplicate (DUP)
1203584987	401492001(B35RM1) Matrix Spike (MS)
1203584988	Laboratory Control Sample (LCS)

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

Data Summary:

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

Product: **TC99_EIE_LSC: COMMON**
Analytical Method: TC99_EIE_LSC
Analytical Procedure: GL-RAD-A-059 REV# 4
Analytical Batch: 1582186

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

GEL Sample ID#	Client Sample Identification
401492001	B35RM1
401492002	B35RM9
1203585992	Method Blank (MB)
1203585993	400884001(NonSDG) Sample Duplicate (DUP)
1203585994	Laboratory Control Sample (LCS)

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

Data Summary:

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

applicable, with the following exceptions.

Technical Information

Recounts
Samples 1203585993 (Non SDG 400884001DUP) and 401492002 (B35RM9) were recounted to verify sample results. Recounts are reported.

Product: **TRITIUM_DIST_LSC: COMMON**
Analytical Method: TRITIUM_DIST_LSC
Analytical Procedure: GL-RAD-A-002 REV# 21
Analytical Batch: 1582195

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

GEL Sample ID#	Client Sample Identification
401492001	B35RM1
401492002	B35RM9
1203586023	Method Blank (MB)
1203586024	400884001(NonSDG) Sample Duplicate (DUP)
1203586025	400884001(NonSDG) Matrix Spike (MS)
1203586026	Laboratory Control Sample (LCS)

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

Data Summary:

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

Certification Statement

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

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Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL401492 GEL Work Order: 401492

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: Theresa L Austin **Name: Theresa Austin**

Date: 09 AUG 2016 **Title: Group Leader**

Sample Data Summary

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492001**	**Date Collected:**	**07/10/2016 12:29**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM1**			**Prep Basis:**	**"As Received"**
Batch ID:	**1581778**	**Method:**	**DOE EML HASL-300,I-01 Mo**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**08/05/2016 15:28**	**Analyst:**	**MJH1**	**Instrument:**	**XRAY1**
Data File:	**I401492001.CNF;1**	**Aliquot:**	**1.5 L**	**Count Time:**	**120 min**
Prep Batch:	**1581778**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**08/04/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	-0.105	pCi/L	+/-0.242	0.247	0.437	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492001**	**Date Collected:**	**07/10/2016 12:29**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM1**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582186**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**07/26/2016 09:39**	**Analyst:**	**GXR1**	**Instrument:**	**LSCBROWN**
Data File:	**E1582186.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**30 min**
Prep Batch:	**1582186**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**07/22/2016 13:25**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99	U	3.72	pCi/L	+/-21.4	21.4	36.8	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	24700	28900	CPM	85.3	(30%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492001**	**Date Collected:**	**07/10/2016 12:29**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM1**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582195**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**07/25/2016 11:43**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCRED**
Data File:	**T1582195.xls**	**Aliquot:**	**50 mL**	**Count Time:**	**40 min**
Prep Batch:	**1582195**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**07/22/2016 12:17**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium	U	-2.57	pCi/L	+/-183	183	323	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492002**	**Date Collected:**	**07/10/2016 14:02**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM9**			**Prep Basis:**	**"As Received"**
Batch ID:	**1581778**	**Method:**	**DOE EML HASL-300,I-01 Mo**	**SOP Ref:**	**GL-RAD-A-006**
Run Date:	**08/05/2016 15:32**	**Analyst:**	**MJH1**	**Instrument:**	**XRAY2**
Data File:	**I401492002.CNF;1**	**Aliquot:**	**1.5 L**	**Count Time:**	**120 min**
Prep Batch:	**1581778**	**Prep Method:**	**DOE EML HASL-300,I-01 M**		
Prep Date:	**08/04/2016 00:00**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
15046-84-1	Iodine-129	U	0.260	pCi/L	+/-0.427	0.444	0.849	1.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492002**	**Date Collected:**	**07/10/2016 14:02**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM9**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582186**	**Method:**	**TC99_EIE_LSC**	**SOP Ref:**	**GL-RAD-A-059**
Run Date:	**07/27/2016 11:00**	**Analyst:**	**GXR1**	**Instrument:**	**LSCBROWN**
Data File:	**E1582186R.xls**	**Aliquot:**	**100 mL**	**Count Time:**	**30 min**
Prep Batch:	**1582186**	**Prep Method:**	**DOE EML HASL-300, Tc-02-**		
Prep Date:	**07/22/2016 13:25**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
14133-76-7	Technetium-99		199	pCi/L	+/-27.6	35.3	38.2	50.0

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Technetium-99m Tracer	23700	28900	CPM	82.1	(30%-105%)

Comments:

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

Rad
Certificate of Analysis
Sample Summary

SDG Number:	**GEL401492**	**Client:**	**CPRC001**	**Project:**	**CPRC0A16006**
Lab Sample ID:	**401492002**	**Date Collected:**	**07/10/2016 14:02**	**Matrix:**	**WATER**
		Date Received:	**07/13/2016 09:10**		
Client ID:	**B35RM9**			**Prep Basis:**	**"As Received"**
Batch ID:	**1582195**	**Method:**	**TRITIUM_DIST_LSC**	**SOP Ref:**	**GL-RAD-A-002**
Run Date:	**07/25/2016 12:25**	**Analyst:**	**TXJ1**	**Instrument:**	**LSCRED**
Data File:	**T1582195.xls**	**Aliquot:**	**50 mL**	**Count Time:**	**40 min**
Prep Batch:	**1582195**	**Prep Method:**	**EPA 906.0 Modified**		
Prep Date:	**07/22/2016 12:17**				

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10028-17-8	Tritium		570	pCi/L	+/-215	242	327	400

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits

Comments:

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

Quality Control Summary

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QC Summary

Report Date: August 8, 2016
Page 1 of 2

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **401492**

Parmname	NOM		Sample	Qual	QC	Units	QC Criteria		Range	Analyst	Date Time
Rad Gamma Spec											
Batch 1581778											
QC1203584985 MB											
Iodine-129				U	-0.117	pCi/L				MJH1	08/06/1615:24
Uncert:					+/-0.234						
TPU:					+/-0.240						
QC1203584986 401492001 DUP											
Iodine-129		U	-0.105	U	-0.0243	pCi/L					08/06/1615:24
Uncert:			+/-0.242		+/-0.234		RPD:	0	N/A		
TPU:			+/-0.247		+/-0.234		RER:	0.465	(0-2)		
QC1203584987 401492001 MS											
Iodine-129	27.7	U	-0.105		25.3	pCi/L	REC:	92	(75%-125%)		08/06/1615:25
Uncert:			+/-0.242		+/-1.97						
TPU:			+/-0.247		+/-3.21						
QC1203584988 LCS											
Iodine-129	27.7				29.0	pCi/L	REC:	104	(80%-120%)		08/06/1615:27
Uncert:					+/-2.01						
TPU:					+/-3.53						
Rad Liquid Scintillation											
Batch 1582186											
QC1203585992 MB											
Technetium-99				U	1.14	pCi/L				GXR1	07/26/1613:22
Uncert:					+/-21.7						
TPU:					+/-21.7						
**Technetium-99m Tracer	28900				24100	CPM	REC:	83	(30%-105%)		
QC1203585993 400884001 DUP											
Technetium-99			41.3		55.8	pCi/L					07/27/1612:35
Uncert:			+/-22.8		+/-22.8		RPD:	30	(0% - 100%)		
TPU:			+/-23.2		+/-23.6		RER:	0.858	(0-2)		
**Technetium-99m Tracer	28900		24500		24400	CPM	REC:	84	(30%-105%)		
QC1203585994 LCS											
Technetium-99	861				837	pCi/L	REC:	97	(80%-120%)		07/26/1614:25
Uncert:					+/-38.2						
TPU:					+/-100						
**Technetium-99m Tracer	28900				25400	CPM	REC:	88	(30%-105%)		
Batch 1582195											
QC1203586023 MB											
Tritium				U	-22.9	pCi/L				TXJ1	07/25/1617:19
Uncert:					+/-180						
TPU:					+/-180						
QC1203586024 400884001 DUP											
Tritium		U	39.3	U	165	pCi/L					07/25/1618:01
Uncert:			+/-195		+/-198		RPD:	0	N/A		
TPU:			+/-195		+/-200		RER:	0.882	(0-2)		
QC1203586025 400884001 MS											
Tritium	2320	U	39.3		1900	pCi/L	REC:	82	(75%-125%)		07/25/1618:43

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QC Summary

Workorder: **401492**

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch 1582195									
	Uncert:	+/-195		+/-275					
	TPU:	+/-195		+/-459					
QC1203586026 LCS									
Tritium	2320			1940	pCi/L	REC: 84	(80%-120%)		07/25/1619:25
	Uncert:			+/-274					
	TPU:			+/-464					

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
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 associated QC sample blank has a result >= 2X the MDA and, after corrections, result is >= MDA for this sample
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
D	Results are reported from a diluted aliquot of sample.
E	Reported value is estimated due to interferences. See comment in narrative.
M	Duplicate precision not met.
N	Spike Sample recovery is outside control limits.
S	Reported value determined by the Method of Standard Additions (MSA)
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
UX	Gamma Spectroscopy--Uncertain identification
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.
** Indicates analyte is a surrogate compound.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptence 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.