

December 11, 2020

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

Re: CHPRC SAF X21-001
Work Order: 527601
SDG: GEL527601

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 17, 2020. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

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,



Clare Drennen for
Heather Shaffer
Project Manager

Purchase Order: 300071 - 7H
Chain of Custody: X21-001-209, X21-001-210, X21-001-211, X21-001-212 and X21-001-280
Enclosures



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Case Narrative

**General Narrative
for
CH2MHill Plateau Remediation Company (74393)
CHPRC SAF X21-001
SDG: GEL527601**

December 11, 2020

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 November 17, 2020, 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.

Sample Identification

The laboratory received the following samples:

<u>Laboratory Identification</u>	<u>Sample Description</u>
527601001	B3XBD1
527601002	B3XBD6
527601003	B3XBV2
527601004	B3X9N8
527601005	B3XBD5
527601006	B3XBD4

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: General Chemistry, Metals and Radiochemistry.

We certify that this package is in compliance with the Analytical Laboratory Services for CH2M Hill Plateau Remediation Company Statement of Work, 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 data package deliverable 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.



Clare Drennen for
Heather Shaffer
Project Manager

Technical Case Narrative
CH2MHill Plateau Remediation Company
SDG #: GEL527601
Work Order #: 527601

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.

General Chemistry

Hexavalent Chromium

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

SMR_SR_RAD_GPC

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

CH2M Hill Plateau Remediation Company		C.O.C.# X21-001-210 Page 1 of 1	
527601		Telephone No.: 509-376-4650	
Collector: Mike Esparza / JCHPRC	Contact/Requester: Karen Waters-Husted	Purchase Order/Charge Code: 303064	
SAF No.: X21-001	Sampling Origin: Hanford Site	Ice Chest No.: 605-182 641	
Project Title: AQUIFER TUBES, OCTOBER 2020	Logbook No.: HNF-N-506	Bill of Lading/Air Bill No.: 7720 9697 5999	
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Offsite Property No.: N/A	
Protocol: SURV	Priority: 30 Days	SPECIAL INSTRUCTIONS N/A	
POSSIBLE SAMPLE HAZARDS/REMARK ** 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	* Time	No/Type Container	Sample Analysis
B3XB01	Y	NOV 16 2020 1045 1x60-mL aG	7196_CR6: COMMON 24 Hours Preservative Cool <=6C

Relinquished By		Received By	
Print First and Last Name	Signature	Print First and Last Name	Signature
Mike Esparza / JCHPRC	<i>Mike Esparza</i>	Lesly Wall / JCHPRC	<i>Lesly Wall</i>
Date/Time	Date/Time	Date/Time	Date/Time
NOV 16 2020 1400	NOV 16 2020 1400	NOV 16 2020 1030	NOV 16 2020 1030
Lesly Wall / JCHPRC	<i>Lesly Wall</i>	Stacy Boone / GEL Laboratories	<i>Stacy Boone</i>
NOV 16 2020 1400	NOV 16 2020 1400	NOV 17 2020 1000	NOV 17 2020 1000
FED EX	FED EX		
Disposal Method (e.g., Return to customer, per lab procedure, used in process):		Disposed By:	
Date/Time:		Date/Time:	

CH2M Hill Plateau Remediation Company		C.O.C.# X21-001-212 Page 1 of 1	
Collector: Mike Esparza /CHPRC	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4650	
SAF No.: X21-001	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 303064	
Project Title: AQUIFER TUBES, OCTOBER 2020	Logbook No.: HNF-N-506 63	Ice Chest No.: 6005-182 641	
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Bill of Lading/Air Bill No.: 7720 9697 5079	
Protocol: SURV	Priority: 30 Days	Offsite Property No.: N/A	
POSSIBLE SAMPLE HAZARDS/REMARK *** 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 N/A	
Sample No. Filter	Time	No/Type Container	Sample Analysis
B3XBD6	y	NOV 16 2020 1014 1x60-mL aG	7196_CR6: COMMON 24 Hours Cool <=6C

Relinquished By		Received By	
Print First and Last Name	Signature	Print First and Last Name	Signature
Mike Esparza /CHPRC		Stacy Boone GEL Laboratories	
	NOV 16 2020 1400		NOV 16 2020 1257
	NOV 16 2020 1400		NOV 17 2020 1000
	FED EX		FEDEX

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process): Disposed By:	Date/Time:
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CH2M Hill Plateau Remediation Company		C.O.C.# X21-001-280 Page 1 of 1	
527691		Telephone No.: 509-376-4650	
Collector: Mike Esparza /CHPRC	Contact/Requester: Karen Waters-Husted	Purchase Order/Charge Code: 303064	
SAF No.: X21-001	Sampling Origin: Hanford Site	Ice Chest No.: 6005-182641	
Project Title: AQUIFER TUBES, OCTOBER 2020	Logbook No.: HNF-N-506 603	Bill of Lading/Air Bill No.: 7720 9697 5999	
Shipped To (Lab): GEL Laboratories, LLC	Method of Shipment: Commercial Carrier	Offsite Property No.: N/A	
Protocol: SURV	Priority: 30 Days	SPECIAL INSTRUCTIONS N/A	
<p>POSSIBLE SAMPLE HAZARDS/REMARK</p> <p>** ** 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</p>			
Sample No. Filter	Date	Time	No/Type Container
B3XBV2	Y	NOV 16 2020 1130	1x60-mL aG
Sample Analysis		Holding Time	Preservative
7196_CR6: COMMON		24 Hours	Cool <=6C

Relinquished By		Received By	
Print First and Last Name	Signature	Print First and Last Name	Signature
Mike Esparza /CHPRC	<i>[Signature]</i>	Stacy Boone /GEL Laboratories	<i>[Signature]</i>
NOV 16 2020 1400		NOV 16 2020 1200	
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CH2M Hill Plateau Remediation Company		C.O.C.# X21-001-2111 Page 1 of 1					
Collector: Mike Esparza /CHPRC		Telephone No.: 509-376-4650					
SAF No.: X21-001		Purchase Order/Charge Code: 303064					
Project Title: AQUIFER TUBES, OCTOBER 2020		Ice Chest No.: 605-150					
Shipped To (Lab): GEL Laboratories, LLC		Bill of Lading/Air Bill No.: 7720 9077 719					
Protocol: SURV		Offsite Property No.: N/A					
POSSIBLE SAMPLE HAZARDS/REMARK ** 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 N/A							
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3XBD5	Y	NOV 16 2020	1014	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2
B3XBD4	N	↓	↓	1x500-mL G/P	6020_METALS_ICPMS: Chromium (1)	6 Months	HNO3 to pH <2

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

527601

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No.: HNF-N-506 63
 Method of Shipment Commercial Carrier
 Priority: 30 Days

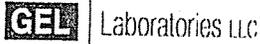
SPECIAL INSTRUCTIONS
N/A

Relinquished By		Received By	
Print First and Last Name	Signature	Print First and Last Name	Signature
Mike Esparza /CHPRC	<i>[Signature]</i>	Stacy Wood	<i>[Signature]</i>
Date/Time	Signature	Date/Time	Signature
NOV 16 2020 1330		NOV 16 2020 1330	
NOV 16 2020 1400		NOV 17 2020 1000	
Disposal Method (e.g., Return to customer, per lab procedure, used in process): Disposed By:		Date/Time:	
FINAL SAMPLE DISPOSITION		Date/Time:	

Matrix *

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



SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>527601</u>	
Received By: <u>Stacy L. Brown</u>		Date Received: <u>17-Nov-20</u>	
Carrier and Tracking Number		Circle Applicable: FedEx Express <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <input type="checkbox"/>	
		<u>7720 9697 5979 1c</u>	
		<u>7720 9677 7119 1c</u>	
		<u>7720 9496 4383 1c</u>	
Suspected Hazard Information		Yes	No
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
A) Shipped as a DOT Hazardous?			Hazard Class Shipped: _____ UN#: _____ If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___
B) Did the client designate the samples are to be received as radioactive?		<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: <u>Rad 1 Rad 2 Rad 3</u>
D) Did the client designate samples are hazardous?		<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		If D or E is yes, select Hazards below. PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other: _____	
Sample Receipt Criteria		Yes	NA
		No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	Circle Applicable: Seats broken <input type="checkbox"/> Damaged container <input type="checkbox"/> Leaking container <input type="checkbox"/> Other (describe) _____
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	Circle Applicable: Client contacted and provided COC <input type="checkbox"/> COC created upon receipt <input type="checkbox"/>
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	Preservation Method: Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius TEMP: _____
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	Temperature Device Serial #: <u>IRI-20</u> Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	Circle Applicable: Seats broken <input type="checkbox"/> Damaged container <input type="checkbox"/> Leaking container <input type="checkbox"/> Other (describe) _____
6	Samples requiring chemical preservation at proper pH? <u>SB</u>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: <u>B3XPP4</u> If Preservation added, Lot#: <u>200916</u>
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA ___ (If unknown, select No) Are liquid VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA ___ Sample ID's and containers affected: _____
8	Samples received within holding time?	<input checked="" type="checkbox"/>	ID's and tests affected: _____
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	ID's and containers affected: _____
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	Circle Applicable: No dates on containers <input type="checkbox"/> No times on containers <input type="checkbox"/> COC missing info <input type="checkbox"/> Other (describe) _____
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	Circle Applicable: No container count on COC <input type="checkbox"/> Other (describe) _____
12	Are sample containers identifiable as GEL provided by use of GEL labels?	<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	Circle Applicable: Not relinquished <input type="checkbox"/> Other (describe) _____
Comments (Use Continuation Form if needed):			

PM (or PMA) review: Initials CD Date 11/18/20 Page 1 of 1

Data Review Qualifier Definitions

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.		
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics 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 analyte was detected in the associated method blank \geq MDC or $>$ 5% sample activity.	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 \geq 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 \geq 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	
o	Analyte failed to recover within LCS limits	Radiological	Rad

Laboratory Certifications

List of current GEL Certifications as of 02 December 2020

State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
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	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122021-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2019-165
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-20-17
Utah NELAP	SC000122020-33
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
CH2MHill Plateau Remediation Company
SDG #: GEL527601
Work Order #: 527601

Product: Determination of Metals by ICP-MS**Analytical Method:** SW846 3005A/6020B**Analytical Procedure:** GL-MA-E-014 REV# 34**Analytical Batch:** 2063952**Preparation Method:** SW846 3005A**Preparation Procedure:** GL-MA-E-006 REV# 14**Preparation Batch:** 2063951

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
527601005	B3XBD5
527601006	B3XBD4
1204696982	Method Blank (MB)ICP-MS
1204696983	Laboratory Control Sample (LCS)
1204696986	527592006(NonSDGL) Serial Dilution (SD)
1204696984	527592006(NonSDGS) Matrix Spike (MS)
1204696985	527592006(NonSDGSD) Matrix Spike Duplicate (MSD)

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.

Calibration Information**ICSA/ICSAB Statement**

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

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**

CPRC002 CH2MHill Plateau Remediation Company (74393)

Client SDG: GEL527601 GEL Work Order: 527601

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Review/Validation

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

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

Signature:**Name: Edmund Frampton****Date: 03 DEC 2020****Title: Team Leader**

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL527601

CONTRACT: CPRC0X21001

METHOD TYPE: SW846

SAMPLE ID: 527601005

BASIS: As Received

DATE COLLECTED 16-NOV-20

CLIENT ID: B3XBD5

LEVEL: Low

DATE RECEIVED 17-NOV-20

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	3.00	ug/L	U	3.00	10.0	10.0	1	MS	PRB	12/01/20 22:48	201201-1	2063952

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2063952	2063951	SW846 3005A	50	mL	50	mL	11/25/20	HH1

***Analytical Methods:**

MS SW846 3005A/6020B

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: GEL527601

CONTRACT: CPRC0X21001

METHOD TYPE: SW846

SAMPLE ID: 527601006

BASIS: As Received

DATE COLLECTED 16-NOV-20

CLIENT ID: B3XBD4

LEVEL: Low

DATE RECEIVED 17-NOV-20

MATRIX: WATER

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-47-3	Chromium	3.00	ug/L	U	3.00	10.0	10.0	1	MS	PRB	12/01/20 22:52	201201-1	2063952

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2063952	2063951	SW846 3005A	50	mL	50	mL	11/25/20	HH1

***Analytical Methods:**

MS SW846 3005A/6020B

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: December 3, 2020

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 527601

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	2063952										
QC1204696983		LCS									
Chromium	50.0			46.8	ug/L		93.5	(80%-120%)	PRB	12/01/20	22:16
QC1204696982		MB									
Chromium			U	3.00	ug/L					12/01/20	22:12
QC1204696984		527592006 MS									
Chromium	50.0		11.6	59.1	ug/L		95	(75%-125%)		12/01/20	22:27
QC1204696985		527592006 MSD									
Chromium	50.0		11.6	59.5	ug/L	0.738	95.9	(0%-20%)		12/01/20	22:30
QC1204696986		527592006 SDILT									
Chromium			11.6 DU	15.0	ug/L	N/A		(0%-20%)		12/01/20	22:37

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

GEL LABORATORIES LLC

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QC Summary

Workorder: 527601

Page 2 of 2

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

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
Technical Case Narrative
CH2MHill Plateau Remediation Company
SDG #: GEL527601
Work Order #: 527601**

Product: Hexavalent Chromium**Analytical Method:** 7196_CR6**Analytical Procedure:** GL-GC-E-132 REV# 3**Analytical Batch:** 2063684

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
527601001	B3XBD1
527601002	B3XBD6
527601003	B3XBV2
1204696463	Method Blank (MB)
1204696464	Laboratory Control Sample (LCS)
1204696465	527592001(NonSDG) Sample Duplicate (DUP)
1204696466	527592001(NonSDG) Post Spike (PS)

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

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**Qualifier Definition Report
for**

CPRC002 CH2MHill Plateau Remediation Company (74393)

Client SDG: GEL527601 GEL Work Order: 527601

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).

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:** Aubrey Kingsbury**Date:** 19 NOV 2020**Title:** Data Validator

Sample Data Summary

Certificate of Analysis

Report Date: November 19, 2020

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X21-001

Client Sample ID: B3XBBD1 Project: CPRC0X21001
 Sample ID: 527601001 Client ID: CPRC002
 Matrix: WATER
 Collect Date: 16-NOV-20 10:45
 Receive Date: 17-NOV-20
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Nutrient Analysis												
7196_CR6: COMMON (Lachat) "As Received"												
Hexavalent Chromium	B	0.00147	0.00130	0.00400	mg/L		1	AXH3	11/17/20	1056	2063684	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	7196_CR6	

Notes:

Column headers are defined as follows:

- DF: Dilution Factor
- DL: Detection Limit
- MDA: Minimum Detectable Activity
- MDC: Minimum Detectable Concentration
- Lc/LC: Critical Level
- PF: Prep Factor
- RL: Reporting Limit
- SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: November 19, 2020

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X21-001

Client Sample ID: B3XBD6 Project: CPRC0X21001
 Sample ID: 527601002 Client ID: CPRC002
 Matrix: WATER
 Collect Date: 16-NOV-20 10:14
 Receive Date: 17-NOV-20
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Nutrient Analysis												
7196_CR6: COMMON (Lachat) "As Received"												
Hexavalent Chromium	U	0.00130	0.00130	0.00400	mg/L		1	AXH3	11/17/20	1058	2063684	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	7196_CR6		

Notes:

Column headers are defined as follows:

- DF: Dilution Factor
- DL: Detection Limit
- MDA: Minimum Detectable Activity
- MDC: Minimum Detectable Concentration
- Lc/LC: Critical Level
- PF: Prep Factor
- RL: Reporting Limit
- SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: November 19, 2020

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF X21-001

Client Sample ID: B3XBV2 Project: CPRC0X21001
 Sample ID: 527601003 Client ID: CPRC002
 Matrix: WATER
 Collect Date: 16-NOV-20 11:36
 Receive Date: 17-NOV-20
 Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Nutrient Analysis												
7196_CR6: COMMON (Lachat) "As Received"												
Hexavalent Chromium		0.0161	0.00130	0.00400	mg/L		1	AXH3	11/17/20	1059	2063684	1

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	7196_CR6		

Notes:

Column headers are defined as follows:

- DF: Dilution Factor
- DL: Detection Limit
- MDA: Minimum Detectable Activity
- MDC: Minimum Detectable Concentration
- Lc/LC: Critical Level
- PF: Prep Factor
- RL: Reporting Limit
- SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: November 19, 2020

Page 1 of 2

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 527601

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	2063684										
QC1204696465		527592001	DUP								
Hexavalent Chromium	B	0.00309	B	0.00291	mg/L	6 ^		(+/-0.00400)	AXH3	11/17/20	10:41
QC1204696464		LCS									
Hexavalent Chromium	0.0500			0.0480	mg/L		96	(90%-110%)		11/17/20	10:37
QC1204696463		MB									
Hexavalent Chromium			U	0.00130	mg/L					11/17/20	10:36
QC1204696466		527592001	PS								
Hexavalent Chromium	0.0500	B	0.00309	0.0506	mg/L		95	(90%-110%)		11/17/20	10:43

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- 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

GEL LABORATORIES LLC

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QC Summary

Workorder: 527601

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	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
SDG #: GEL527601
Work Order #: 527601

Product: SMR_SR_RAD_GPC

Analytical Method: SR_RAD_GPC

Analytical Procedure: GL-RAD-A-004 REV# 21

Analytical Batch: 2064032

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
527601004	B3X9N8
1204697125	Method Blank (MB)
1204697126	527601004(B3X9N8) Sample Duplicate (DUP)
1204697127	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.

GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

CPRC002 CH2MHill Plateau Remediation Company (74393)

Client SDG: GEL527601 GEL Work Order: 527601

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: 11 DEC 2020****Title: Group Leader**

Sample Data Summary

GEL527601

Dec 15 2020

Page 1 Rev 0

**Certificate of Analysis
Sample Summary**

SDG Number: GEL527601	Client: CPRC002	Project: CPRC0X21001
Lab Sample ID: 527601004	Date Collected: 11/16/2020 10:45	Matrix: WATER
	Date Received: 11/17/2020 10:00	
Client ID: B3X9N8	Method: SR_RAD_GPC	Prep Basis: "As Received"
Batch ID: 2064032	Analyst: JXC9	SOP Ref: GL-RAD-A-004
Run Date: 11/24/2020 12:19	Aliquot: 300 mL	Instrument: PIC1C
Data File: S2064032r2.xls	Prep Method: EPA 905.0 Modified/DOE RP5	Count Time: 60 min
Prep Batch: 2064032		
Prep Date: 11/23/2020 09:14		

CAS No.	Parmname	Qual	Result	Units	Uncert	TPU	MDC	RDL
10098-97-2	Strontium-90	U	-0.184	pCi/L	+/-0.773	0.773	1.54	2.00

Surrogate/Tracer recovery	Result	Nominal	Units	Recovery%	Acceptable Limits
Strontium Carrier	3.90	4.29	mg	90.9	(40%-110%)

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

QC Summary

Report Date: December 11, 2020
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Client : CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 527601

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Gas Flow									
Batch	2064032								
QC1204697125	MB								
Strontium-90			U	-0.149	pCi/L			JXC9	11/24/2012:19
				Uncert: +/-0.829					
				TPU: +/-0.829					
**Strontium Carrier		4.29		4.00	mg	REC: 93	(40%-110%)		
QC1204697126	527601004	DUP							
Strontium-90		U	-0.184	U	-0.144				11/24/2012:19
			Uncert: +/-0.773		+/-0.841	RPD: 0	N/A		
			TPU: +/-0.773		+/-0.841	RER: 0.0699	(0-2)		
**Strontium Carrier		4.29	3.90	3.70	mg	REC: 86	(40%-110%)		
QC1204697127	LCS								
Strontium-90		72.5		72.1	pCi/L	REC: 99.4	(80%-120%)		11/24/2012:19
				Uncert: +/-4.66					
				TPU: +/-17.3					
**Strontium Carrier		4.29		3.40	mg	REC: 79	(40%-110%)		

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
- 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 the associated method blank >= MDC or >5% sample activity.
- 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
- o Analyte failed to recover within LCS limits

QC Summary

Workorder: 527601

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Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

** 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.