

July 17, 2017



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gel.com

June 27, 2017

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

Re: CHPRC SAF W17-006
Work Order: 426170
SDG: GEL426170

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 23, 2017. 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: 300071 - 7H
Chain of Custody: W17-006-064, W17-006-067, W17-006-068 and W17-006-069
Enclosures



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Case Narrative

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General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W17-006
SDG: GEL426170

June 27, 2017

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 23, 2017, 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>
426170001	B39NW9
426170002	B39XR6
426170003	B39XR9
426170004	B39NX5
426170005	B39NX7
426170006	B39XT0
426170007	B39XT1
426170008	B39NX9

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.

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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.

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.


Brielle Luthman for
Heather Shaffer
Project Manager

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General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426170
Work Order #: 426170

Cyanide, Free

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.

Miscellaneous Information

Additional Comments

Total CN levels above the MDL for Free CN were detected in samples . Free CN was performed per SOP (GL-GC-E-073).

Cyanide, Amenable to Chlorination

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.

Cyanide, Total

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

Sample Dilutions

The following samples 1203818396 (B39NW9DUP), 1203818398 (B39NW9MS), 426170001 (B39NW9), 426170002 (B39XR6) and 426170007 (B39XT1) were diluted because target analyte concentrations exceeded the calibration range.

Analyte	426170		
	001	002	007
Cyanide, Total	5X	5X	5X

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

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requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Chain of Custody and Supporting Documentation

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CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **W17-006-064**
Page 1 of 1

Juan Aguilar /CHPRC

Contact/Requester: **Karen Waters-Husted** Telephone No. **509-376-4650**

Collector: **W17-006** Sampling Origin: **Hanford Site**

Project Title: **RCRA, JUNE 2017** Logbook No. **HNF-N-506 88 / 82** Purchase Order/Charge Code: **300071**

Shipped To (Lab): **GEL Laboratories, LLC** Method of Shipment: **Commercial Carrier** Ice Chest No. **6205-458** Bill of Lading/Air Bill No. **779467947636**

Protocol: **RCRA** Priority: **30 Days** **PRIORITY** Offsite Property No. **8077**

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: **N/A** Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39NW9	N	W	6-21-17	1156	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C
B39XR6	Y	W	6-21-17	1156	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
<i>Juan Aguilar /CHPRC</i>			JUN 21 2017 1426	SSU #1			JUN 21 2017 1426	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
<i>Juan Aguilar /CHPRC</i>			JUN 22 2017 6130	Janelle Zunker CHPRC	<i>Janelle Zunker</i>		JUN 22 2017 6130	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
<i>Juan Aguilar /CHPRC</i>			JUN 22 2017 1400				JUN 22 2017 1400	
<i>Juan Aguilar /CHPRC</i>				M-Kinslow	<i>M-Kinslow</i>		6-23-17 0920	

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

Disposed By: *M-Kinslow*

FINAL SAMPLE DISPOSITION

PRINTED ON 4/26/2017

FSR ID = FSR41795

A-6004-842 (REV 2)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

W17-006-067

Page 1 of 1

Collector: Juan Aguilar /CHPRC
 SAF No. W17-006
 Project Title: RCRA, JUNE 2017
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: RCRA

Contact/Requester: Karen Waters-Husted
 Sampling Origin: Hanford Site
 Logbook No. HNF-N-506 88 / 83
 Method of Shipment: Commercial Carrier
 Priority: 30 Days

Telephone No. 509-376-4650
 Purchase Order/Charge Code. 300071
 Ice Chest No. CWS-458
 Bill of Lading/Air Bill No. 7794 6794 7030
 Offsite Property No. 8077

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: N/A
 Total Activity Exemption: Yes No

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39XR9	Y	W	6-21-17	1411	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C
B39NX5	N	W	6-21-17	1411	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

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Relinquished By: Juan Aguilar /CHPRC
 Relinquished By: SSU #1
 Relinquished By: Janelle Zunker /CHPRC
 Relinquished By: M-Kinslow

Print: [Signature]
 Sign: JUN 21 2017
 Date/Time: 1420

Received By: SSU #1
 Received By: Janelle Zunker /CHPRC
 Received By: FEDEX
 Received By: M-Kinslow

Print: [Signature]
 Sign: JUN 22 2017
 Date/Time: 6730

Print: [Signature]
 Sign: JUN 22 2017
 Date/Time: 1400

Print: [Signature]
 Sign: JUN 23 2017
 Date/Time: 0920

Disposal Method (e.g., Return to customer, per lab procedure, used in process):
 Disposed By: M-Kinslow

FINAL SAMPLE DISPOSITION

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

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CH2M Hill Plateau Remediation Company		C.O.C.# W17-006-068	
426170		Page 1 of 1	
Collector Juan Aguilar /CHPRC	W17-006	Contact/Requester Karen Waters-Husted	Telephone No. 509-376-4650
SAF No.	RCRA, JUNE 2017	Sampling Origin Hanford Site	Purchase Order/Charge Code 300071
Project Title	RCRA, JUNE 2017	Logbook No. HNF-N-506 88 / 82	Ice Chest No. 6205-458
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment Commercial Carrier	Bill of Lading/Air Bill No. 7799 6794703A
Protocol	RCRA	Priority: 30 Days	Offsite Property No. 8077
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	
N/A		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Sample No.	Filter *	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39NX7	N	6-21-17	1354	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C
B39XT0	Y	6-21-17	1354	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By Juan Aguilar /CHPRC	Print	Sign	Date/Time	Received By SSU #1	Print	Sign	Date/Time
			JUN 21 2017 1426				JUN 21 2017 1426
Relinquished By SSU #1	Print	Sign	Date/Time	Received By Janelle Zunker /CHPRC	Print	Sign	Date/Time
			JUN 22 2017 0730				JUN 22 2017 0730
Relinquished By Janelle Zunker /CHPRC	Print	Sign	Date/Time	Received By FEDEX	Print	Sign	Date/Time
			JUN 22 2017 1400				JUN 22 2017 1400
Relinquished By FX	Print	Sign	Date/Time	Received By M. Kraslow	Print	Sign	Date/Time
			JUN 22 2017 1400				JUN 22 2017 1400
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time	
				M. Kraslow		6-23-17 0920	

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CH2M Hill Plateau Remediation Company		C.O.C.# W17-006-069	
426170		Page 1 of 1	
Collector	Juan Aguilar /CHPRC	Contact/Requester	Karen Waters-Husted
SAF No.	W17-006	Sampling Origin	Hanford Site
Project Title	RCRA, JUNE 2017	Logbook No.	HNF-N-506 88 / 82
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier
Protocol	RCRA	Priority:	30 Days
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 N/A	Hold Time Total Activity Exemption: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Telephone No.	509-376-4650	Purchase Order/Charge Code	300071
Ice Chest No.	6WS-458	Bill of Lading/Air Bill No.	7794 6794 7634
Offsite Property No.	7779	Offsite Property No.	8077

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B39XT1	Y	W	6-21-17	1250	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C
B39NX9	N	W	6-21-17	1250	1x500-mL aG	9012_CYANIDE (TOTAL): COMMON; 9012_CN (AMENABLE): COMMON; 9014_CN (FREE): COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By Juan Aguilar /CHPRC	Print	Sign	Date/Time
			JUN 21 2017 1426
Relinquished By 155u #1	Print	Sign	Date/Time
			JUN 22 2017 6730
Relinquished By Janelle Zunker /CHPRC	Print	Sign	Date/Time
			JUN 22 2017 1400
Relinquished By 16 of 16	Print	Sign	Date/Time
			JUN 22 2017 1400

Received By 55u #1	Print	Sign	Date/Time
			JUN 21 2017 1426
Received By Janelle Zunker /CHPRC	Print	Sign	Date/Time
			JUN 22 2017 0730
Received By Janelle Zunker /CHPRC	Print	Sign	Date/Time
			JUN 22 2017 1400
Received By M. Kuslan /CHPRC	Print	Sign	Date/Time
			6-23-17 0925

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)	Date/Time

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.	Inorganics	Metals
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 associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq 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 \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	

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Laboratory Certifications

List of current GEL Certifications as of 27 June 2017

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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
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	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

General Chem Analysis

Case Narrative

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General Chemistry
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL426170
Work Order #: 426170

Product: Cyanide, Free

Analytical Method: 9014_CYANIDE

Analytical Procedure: GL-GC-E-073 REV# 6

Analytical Batch: 1676108

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426170001	B39NW9
426170002	B39XR6
426170003	B39XR9
426170004	B39NX5
426170005	B39NX7
426170006	B39XT0
426170007	B39XT1
426170008	B39NX9
1203816327	Method Blank (MB)
1203816328	Laboratory Control Sample (LCS)
1203816329	425898014(NonSDG) Sample Duplicate (DUP)
1203816963	426170001(B39NW9) Sample Duplicate (DUP)

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.

Miscellaneous Information

Additional Comments

Total CN levels above the MDL for Free CN were detected in samples . Free CN was performed per SOP (GL-GC-E-073).

Product: Cyanide, Amenable to Chlorination

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-107 REV# 10

Analytical Batches: 1676524, 1676523 and 1676522

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426170001	B39NW9
426170002	B39XR6
426170003	B39XR9
426170004	B39NX5
426170005	B39NX7
426170006	B39XT0
426170007	B39XT1
426170008	B39NX9

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: Cyanide, Total

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 20

Analytical Batches: 1677002 and 1677001

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426170001	B39NW9
426170002	B39XR6
426170003	B39XR9
426170004	B39NX5
426170005	B39NX7
426170006	B39XT0
426170007	B39XT1
426170008	B39NX9
1203818393	Method Blank (MB)
1203818394	Laboratory Control Sample (LCS)
1203818396	426170001(B39NW9) Sample Duplicate (DUP)
1203818398	426170001(B39NW9) Matrix Spike (MS)

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

Sample Dilutions

The following samples 1203818396 (B39NW9DUP), 1203818398 (B39NW9MS), 426170001 (B39NW9), 426170002 (B39XR6) and 426170007 (B39XT1) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	426170		
	001	002	007
Cyanide, Total	5X	5X	5X

Product: Cyanide, Chlorinated

Analytical Method: 9012_CYANIDE

Analytical Procedure: GL-GC-E-095 REV# 20

Analytical Batches: 1676523 and 1676522

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
426170001	B39NW9
426170002	B39XR6
426170003	B39XR9
426170004	B39NX5
426170005	B39NX7
426170006	B39XT0
426170007	B39XT1
426170008	B39NX9
1203817204	Method Blank (MB)
1203817205	Laboratory Control Sample (LCS)
1203817206	426018001(NonSDG) Sample Duplicate (DUP)
1203818387	426170001(B39NW9) Sample Duplicate (DUP)

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

Sample Dilutions

The following samples 1203818387 (B39NW9DUP), 426170001 (B39NW9) and 426170002 (B39XR6) were diluted because target analyte concentrations exceeded the calibration range. The following sample 426170007 (B39XT1) in this sample group was diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

Samples 1203818387 (B39NW9DUP) and 426170001 (B39NW9) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

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.

July 17, 2017

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: GEL426170 GEL Work Order: 426170

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.

N Spike Sample recovery is outside control limits.

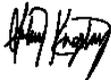
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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: Aubrey Kingsbury

Date: 27 JUN 2017

Title: Analyst I

Sample Data Summary

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39NW9	Project: CPRCOW17006
Sample ID: 426170001	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 11:56	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	635	8.35	25.0	ug/L	1.00	5	AXH3	06/26/17	1221	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	B	8.45	3.00	10.0	ug/L		1	AXH3	06/27/17	1238	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	8.35	8.35	25.0	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39XR6	Project: CPRCOW17006
Sample ID: 426170002	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 11:56	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	650	8.35	25.0	ug/L	1.00	5	AXH3	06/26/17	1224	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	B	9.42	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	8.35	8.35	25.0	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39XR9	Project: CPRCOW17006
Sample ID: 426170003	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 14:11	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		140	1.67	5.00	ug/L	1.00	1	AXH3	06/26/17	1202	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	B	3.00	1.67	5.00	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39NX5	Project: CPRCOW17006
Sample ID: 426170004	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 14:11	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		141	1.67	5.00	ug/L	1.00	1	AXH3	06/26/17	1203	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39NX7	Project: CPRCOW17006
Sample ID: 426170005	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 13:54	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	B	4.14	1.67	5.00	ug/L	1.00	1	AXH3	06/26/17	1204	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39XT0	Project: CPRCOW17006
Sample ID: 426170006	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 13:54	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	B	3.54	1.67	5.00	ug/L	1.00	1	AXH3	06/26/17	1205	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39XT1	Project: CPRCOW17006
Sample ID: 426170007	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 12:50	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total	D	195	8.35	25.0	ug/L	1.00	5	AXH3	06/26/17	1229	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	U	3.00	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	8.35	8.35	25.0	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Certificate of Analysis

Report Date: June 27, 2017

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF W17-006

Client Sample ID: B39NX9	Project: CPRCOW17006
Sample ID: 426170008	Client ID: CPRC001
Matrix: WATER	
Collect Date: 21-JUN-17 12:50	
Receive Date: 23-JUN-17	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis												
9012_CYANIDE (TOTAL): COMMON "As Received"												
Cyanide, Total		194	1.67	5.00	ug/L	1.00	1	AXH3	06/26/17	1207	1677002	1
9014_CN (FREE): COMMON "As Received"												
Free Cyanide	B	3.32	3.00	10.0	ug/L		1	AXH3	06/27/17	1237	1676108	2
9012_CN (AMENABLE): COMMON "See Parent Products"												
Cyanide amenable to chlorination	U	1.67	1.67	5.00	ug/L		1	AXH3	06/26/17	1459	1676524	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	06/26/17	1115	1677001
SW846 9012B	SW846 9012B Cyanide, Chlorinated Prep	AXH3	06/26/17	1207	1676522

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	9012_CYANIDE	
2	9014_CYANIDE	
3	9012_CYANIDE	

Notes:

Column headers are defined as follows:

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

Quality Control Summary

July 17, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 27, 2017

Page 1 of 2

CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 426170

Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD%, REC%, Range, Anlst, Date, Time. Contains data for Flow Injection Analysis and Cyanide, Total tests across multiple batches and samples.

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).

July 17, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 426170

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $>$ 5% of the measured concentration and/or decision level for associated samples.										
D	Results are reported from a diluted aliquot of sample.										
N	Spike Sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

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

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

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