

March 9, 2015

Rev. 1 

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www.gel.com

March 08, 2015

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

Re: CHPRC SAF W15-012
Work Order: 362583
SDG: GEL362583

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on December 06, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. Per client P&D, this data package was revised to correct the Metals Case Narrative.

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

Sincerely,



Heather Shaffer
Project Manager

Purchase Order: 300071JDBA - 7H
Chain of Custody: W15-012-010, W15-012-018 and W15-012-019
Enclosures



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Problem and Discrepancy Report

Problem and Discrepancy Report

GEL

SDG GEL362583

03/03/15

1. The data package has the following issues:

- The metals narrative discusses a MB detect for selenium, which is not reported in this data package, however, there is no discussion of the MB detects for zinc and vanadium which are reported.

Resolution: *Provide correction.*

Lab Response:

The lab will correct and submit a revised data package to correctly narrate the MB.

Case Narrative

Per client P&D, this data package was revised to correct the Metals Case Narrative.

**General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF W15-012
SDG: GEL362583**

March 08, 2015

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 December 06, 2014, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
362583001	B2YH90
362583002	B2YH88
362583003	B2YHC1
362583004	B2YHC0
362583005	B2YHC2

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 and Metals.

This package, to the best of my knowledge, 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 Manger (or designee) and the laboratory's client services representative as verified by their signatures on this report.



Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **W15-012-010**

Page 1 of 1

Collector **M.A. White/CHPRC** Telephone No. **509-376-4650**

SAF No. **W15-012** Contact/Requester **Karen Waters-Husted**

Project Title **RCRA, DECEMBER 2014** Sampling Origin **Hanford Site**

Shipped To (Lab) **GEL Laboratories, LLC** Logbook No. **HNF-N-5067415**

Protocol **RCRA** Method of Shipment **Commercial Carrier**

Priority: **30 Days** Priority **PRIORITY**

Offsite Property No. **5291** Bill of Lading/Air Bill No. **990113726640**

Total Activity Exemption: Yes No

POSSIBLE SAMPLE HAZARDS/REMARKS

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2YH90	Y	W	DEC 05 2014	141	1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B2YH88	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B2YH88	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B2YH88	N	W			1x250-mL G/P	9012_CYANIDE: COMMON	14 Days	NaOH to pH >=12/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
M.A. White/CHPRC	<i>M.A. White</i>		DEC 05 2014 1205	F.M. Han/CHPRC	<i>F.M. Han</i>		DEC 05 2014 1205	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
F.M. Han/CHPRC	<i>F.M. Han</i>		DEC 05 2014 1400	FEDEX				
YED EX				Patricia's Dept P. Hunt			12-6-14 0930	

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

Disposed By

DATE/TIME

FINAL SAMPLE DISPOSITION

PRINTED ON 11/4/2014

A-6004-842 (REV 2)

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CH2MHHI Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **W15-012-019**

Page 1 of 1

Collector R.A. Shepard/CHPRC

Contact/Requester Karen Waters-Husted

Telephone No. 509-376-4650

SAF No. W15-012

Sampling Origin Hanford Site

Purchase Order/Charge Code 300071JDBA

Project Title RCRA, DECEMBER 2014

Logbook No. HNF-N-506-7019

Ice Chest No. 649-301

Shipped To (Lab) GEL Laboratories, LLC

Method of Shipment Commercial Carrier

Bill of Lading/Air Bill No. 7701085165AD

Protocol RCRA

Priority: 30 Days

Offsite Property No. 5246

POSSIBLE SAMPLE HAZARDS/REMARKS

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

SPECIAL INSTRUCTIONS Hold Time

Total Activity Exemption: Yes No

Sample No.	Filler	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2YHC1	N	12/4/14	1343	1x250-mL G/P	9056_ANIONS_IC: COMMON	28 Days/48 Hours	Cool <=6C

March 9, 2015

Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	Date/Time	Matrix *
R.A. Shepard/CHPRC		[Signature]	DEC 04 2014 1418	SSU-1		[Signature]	DEC 04 2014 1418	S = Soil, SE = Sediment, SO = Solid, SL = Sludge, W = Water, O = Air, DS = Drum Solids, DL = Drum Liquids, T = Tissue, WI = Wipe, L = Liquid, V = Vegetation, X = Other
SSU-1		[Signature]	DEC 05 2014	F.M. Harlich/PRC		[Signature]	DEC 05 2014	
F.M. Harlich/PRC		[Signature]	DEC 05 2014	FEDEX		[Signature]	DEC 05 2014	
Relinquished By		FED EX		Received By		Patarica Dent	12-6-14 0930	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Date/Time

Rev. 1

CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **W15-012-018**
 Page 1 of 1

Collector R.A. Shepard/CHPRC
Contact/Requester Karen Waters-Husted
Telephone No. 509-376-4650
SAF No. W15-012
Purchase Order/Charge Code 300071JDBA
Project Title RCRA, DECEMBER 2014
Logbook No. HNF-N-506 7019
Ice Chest No. GWS-301
Shipped To (Lab) GEL Laboratories, LLC
Bill of Lading/Air Bill No. 772108516520
Method of Shipment Commercial Carrier
Priority: 30 Days
Offsite Property No. 5246
Protocol RCRA
Priority: **PRIORITY**

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2YHC0	N	W	12/14/14	1343	1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B2YHC0	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2
B2YHC0	N	W			1x250-mL G/P	9012_CYANIDE: COMMON	14 Days	NaOH to pH >=12/Cool <=6C
B2YHC2	Y	W			1x500-mL G/P	6010_METALS_ICP: COMMON	6 Months	HNO3 to pH <2

SPECIAL INSTRUCTIONS Hold Time
 Total Activity Exemption: Yes No

Relinquished By R.A. Shepard/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By SSU-1	Print <i>[Signature]</i>	Date/Time DEC 04 2014 1418	Matrix * S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
Relinquished By SSU-1	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By F.M. Hall/CHPRC	Print <i>[Signature]</i>	Date/Time DEC 05 2014	
Relinquished By F.M. Hall/CHPRC	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By FEDEX	Print <i>[Signature]</i>	Date/Time DEC 05 2014	
Relinquished By FED EX	Print <i>[Signature]</i>	Sign <i>[Signature]</i>	Received By Patrick Darrb P. Valent	Print <i>[Signature]</i>	Date/Time 12-6-14 0930	

SAMPLE RECEIPT & REVIEW FORM

Client: <u>CPRC</u>		SDG/AR/COC/Work Order: <u>362583</u>
Received By: <u>P. Hunt</u>		Date Received: <u>12-6-14</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0/cpm</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

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: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
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"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7721 1372 6548</u> <u>7721 1372 6640</u> <u>7721 0851 6500</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy--Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 08 March 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122014-16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12

Metals Analysis

Case Narrative

Metals

Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL362583
Work Order #: 362583

Sample ID	Client ID
362583001	B2YH90
362583002	B2YH88
362583004	B2YHC0
362583005	B2YHC2
1203223830	Method Blank (MB)ICP
1203223831	Laboratory Control Sample (LCS)
1203223834	362585001(B2YPL7L) Serial Dilution (SD)
1203223832	362585001(B2YPL7S) Matrix Spike (MS)
1203223833	362585001(B2YPL7SD) Matrix Spike Duplicate (MSD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1441552
Prep Batch :	1441551
Standard Operating Procedures:	GL-MA-E-013 REV# 23 and GL-MA-E-006 REV# 11
Analytical Method:	SW846 3005A/6010C
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

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

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

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

The method blanks (MB) analyzed with this SDG met the acceptance criteria. The concentration for vanadium and zinc in blank was greater than the MDL. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203223830 (MB).

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 362585001 (B2YPL7).

Matrix Spike (MS/MSD) Recovery Statement

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

Matrix Spike Duplicate (MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analyte percent difference (%D) values were within the acceptance criteria. The %D value for barium was not within the acceptance criteria in sample 1203223834 (Non SDG 362585001SDILT).

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were not diluted and prepared according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

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

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: GEL362583 GEL Work Order: 362583

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is $> 5\%$ of the measured concentration and/or decision level for associated samples.
- D Results are reported from a diluted aliquot of sample.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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: Nik-Cole Elmore

Date: 09 MAR 2015

Title: Data Validator

Sample Data Summary

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YH90	Project:	CPRC0W15012
Sample ID:	362583001	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	05-DEC-14 11:41		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	-0.296	+/-1.17	3.50	10.0	ug/L	1	JWJ	12/10/14	2034	1441552	1
Arsenic 7440-38-2	B	8.63	+/-2.40	5.00	30.0	ug/L	1					
Barium 7440-39-3		35.8	+/-7.17	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.231	+/-0.337	1.00	5.00	ug/L	1					
Calcium 7440-70-2		51600	+/-10300	50.0	200	ug/L	1					
Chromium 7440-47-3	B	4.76	+/-1.01	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.700	+/-0.362	1.00	5.00	ug/L	1					
Copper 7440-50-8	B	8.38	+/-1.95	3.00	10.0	ug/L	1					
Iron 7439-89-6	U	19.4	+/-10.7	30.0	100	ug/L	1					
Magnesium 7439-95-4		15000	+/-2990	110	300	ug/L	1					
Manganese 7439-96-5	U	0.781	+/-0.685	2.00	10.0	ug/L	1					
Nickel 7440-02-0	U	1.32	+/-0.565	1.50	5.00	ug/L	1					
Potassium 7440-09-7		6800	+/-1360	50.0	150	ug/L	1					
Silver 7440-22-4	U	0.210	+/-0.336	1.00	5.00	ug/L	1					
Sodium 7440-23-5		12900	+/-2580	100	300	ug/L	1					
Vanadium 7440-62-2		21.7	+/-4.35	1.00	5.00	ug/L	1					
Zinc 7440-66-6	C	12.6	+/-2.75	3.30	10.0	ug/L	1					

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YH90	Project:	CPRC0W15012
Sample ID:	362583001	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM5	12/08/14	0800	1441551

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YH88	Project:	CPRC0W15012
Sample ID:	362583002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	05-DEC-14 11:41		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	1.07	+/-1.19	3.50	10.0	ug/L	1	JWJ	12/10/14	2037	1441552	1
Arsenic 7440-38-2	B	10.5	+/-2.68	5.00	30.0	ug/L	1					
Barium 7440-39-3		36.4	+/-7.29	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.099	+/-0.334	1.00	5.00	ug/L	1					
Calcium 7440-70-2		51700	+/-10300	50.0	200	ug/L	1					
Chromium 7440-47-3		17.2	+/-3.46	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.726	+/-0.364	1.00	5.00	ug/L	1					
Copper 7440-50-8	B	9.98	+/-2.23	3.00	10.0	ug/L	1					
Iron 7439-89-6	B	73.4	+/-17.8	30.0	100	ug/L	1					
Magnesium 7439-95-4		15100	+/-3020	110	300	ug/L	1					
Manganese 7439-96-5	U	1.93	+/-0.770	2.00	10.0	ug/L	1					
Nickel 7440-02-0		8.25	+/-1.72	1.50	5.00	ug/L	1					
Potassium 7440-09-7		6850	+/-1370	50.0	150	ug/L	1					
Silver 7440-22-4	B	1.59	+/-0.461	1.00	5.00	ug/L	1					
Sodium 7440-23-5		13100	+/-2620	100	300	ug/L	1					
Vanadium 7440-62-2		21.9	+/-4.39	1.00	5.00	ug/L	1					
Zinc 7440-66-6	C	13.4	+/-2.91	3.30	10.0	ug/L	1					

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YH88	Project:	CPRC0W15012
Sample ID:	362583002	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM5	12/08/14	0800	1441551

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC0	Project:	CPRC0W15012
Sample ID:	362583004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	04-DEC-14 13:43		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	1.12	+/-1.19	3.50	10.0	ug/L	1	JWJ	12/10/14	2040	1441552	1
Arsenic 7440-38-2	B	5.75	+/-2.02	5.00	30.0	ug/L	1					
Barium 7440-39-3		45.4	+/-9.09	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.112	+/-0.334	1.00	5.00	ug/L	1					
Calcium 7440-70-2		70500	+/-14100	50.0	200	ug/L	1					
Chromium 7440-47-3	B	4.71	+/-0.999	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.406	+/-0.343	1.00	5.00	ug/L	1					
Copper 7440-50-8		11.1	+/-2.43	3.00	10.0	ug/L	1					
Iron 7439-89-6	U	5.33	+/-10.1	30.0	100	ug/L	1					
Magnesium 7439-95-4		20400	+/-4090	110	300	ug/L	1					
Manganese 7439-96-5	U	0.0499	+/-0.667	2.00	10.0	ug/L	1					
Nickel 7440-02-0	U	1.00	+/-0.539	1.50	5.00	ug/L	1					
Potassium 7440-09-7		7860	+/-1570	50.0	150	ug/L	1					
Silver 7440-22-4	U	0.724	+/-0.363	1.00	5.00	ug/L	1					
Sodium 7440-23-5		15100	+/-3020	100	300	ug/L	1					
Vanadium 7440-62-2	C	19.7	+/-3.96	1.00	5.00	ug/L	1					
Zinc 7440-66-6	C	14.8	+/-3.16	3.30	10.0	ug/L	1					

March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC0	Project:	CPRC0W15012
Sample ID:	362583004	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM5	12/08/14	0800	1441551

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC2	Project:	CPRC0W15012
Sample ID:	362583005	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	04-DEC-14 13:43		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result		DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON "As Received"</i>												
Antimony 7440-36-0	U	-0.742	+/-1.18	3.50	10.0	ug/L	1	JWJ	12/10/14	2043	1441552	1
Arsenic 7440-38-2	B	7.51	+/-2.24	5.00	30.0	ug/L	1					
Barium 7440-39-3		47.7	+/-9.54	1.00	5.00	ug/L	1					
Cadmium 7440-43-9	U	0.133	+/-0.334	1.00	5.00	ug/L	1					
Calcium 7440-70-2		70000	+/-14000	50.0	200	ug/L	1					
Chromium 7440-47-3	B	4.61	+/-0.981	1.00	5.00	ug/L	1					
Cobalt 7440-48-4	U	0.749	+/-0.365	1.00	5.00	ug/L	1					
Copper 7440-50-8		10.1	+/-2.25	3.00	10.0	ug/L	1					
Iron 7439-89-6	U	2.32	+/-10.0	30.0	100	ug/L	1					
Magnesium 7439-95-4		20200	+/-4050	110	300	ug/L	1					
Manganese 7439-96-5	U	0.383	+/-0.671	2.00	10.0	ug/L	1					
Nickel 7440-02-0	U	0.709	+/-0.520	1.50	5.00	ug/L	1					
Potassium 7440-09-7		7900	+/-1580	50.0	150	ug/L	1					
Silver 7440-22-4	U	0.148	+/-0.335	1.00	5.00	ug/L	1					
Sodium 7440-23-5		15200	+/-3030	100	300	ug/L	1					
Vanadium 7440-62-2	C	20.0	+/-4.01	1.00	5.00	ug/L	1					
Zinc 7440-66-6	C	14.1	+/-3.03	3.30	10.0	ug/L	1					

March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC2	Project:	CPRC0W15012
Sample ID:	362583005	Client ID:	CPRC001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM5	12/08/14	0800	1441551

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 3005A/6010C	

Quality Control Summary

March 9, 2015

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

QC Summary

Report Date: December 30, 2014

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1441552										
QC1203223831	LCS										
Antimony	500			499	ug/L		99.8	(80%-120%)	JWJ	12/10/14	20:31
Arsenic	500			508	ug/L		102	(80%-120%)			
Barium	500			496	ug/L		99.2	(80%-120%)			
Cadmium	500			501	ug/L		100	(80%-120%)			
Calcium	5000			5100	ug/L		102	(80%-120%)			
Chromium	500			486	ug/L		97.1	(80%-120%)			
Cobalt	500			500	ug/L		100	(80%-120%)			
Copper	500			493	ug/L		98.5	(80%-120%)			
Iron	5000			5050	ug/L		101	(80%-120%)			
Magnesium	5000			5160	ug/L		103	(80%-120%)			
Manganese	500			495	ug/L		99	(80%-120%)			
Nickel	500			492	ug/L		98.4	(80%-120%)			
Potassium	5000			4940	ug/L		98.8	(80%-120%)			
Silver	500			492	ug/L		98.4	(80%-120%)			
Sodium	5000			5140	ug/L		103	(80%-120%)			
Vanadium	500			508	ug/L		102	(80%-120%)			
Zinc	500			503	ug/L		101	(80%-120%)			
QC1203223830	MB										
Antimony			U	ND	ug/L					12/10/14	20:28
Arsenic			U	ND	ug/L						

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

QC Summary

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1441552										
Barium			U	ND	ug/L						
Cadmium			U	ND	ug/L				JWJ	12/10/14	20:28
Calcium			U	ND	ug/L						
Chromium			U	ND	ug/L						
Cobalt			U	ND	ug/L						
Copper			U	ND	ug/L						
Iron			U	ND	ug/L						
Magnesium			U	ND	ug/L						
Manganese			U	ND	ug/L						
Nickel			U	ND	ug/L						
Potassium			U	ND	ug/L						
Silver			U	ND	ug/L						
Sodium			U	ND	ug/L						
Vanadium			B	1.04	ug/L						
Zinc			B	3.55	ug/L						
QC1203223832 362585001 MS											
Antimony	500	U	ND	505	ug/L		101	(75%-125%)		12/10/14	21:02
Arsenic	500	B	5.52	528	ug/L		105	(75%-125%)			
Barium	500	M	51.1	555	ug/L		101	(75%-125%)			
Cadmium	500	U	ND	504	ug/L		101	(75%-125%)			
Calcium	5000		65400	69600	ug/L		N/A	(75%-125%)			
Chromium	500	U	ND	495	ug/L		98.8	(75%-125%)			
Cobalt	500	B	1.15	490	ug/L		97.7	(75%-125%)			

March 9, 2015

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GEL LABORATORIES LLC

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

QC Summary

Workorder: 362583

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1441552										
Copper	500		10.9	513	ug/L		100	(75%-125%)	JWJ	12/10/14	21:02
Iron	5000	U	ND	5040	ug/L		101	(75%-125%)			
Magnesium	5000		19400	25000	ug/L		111	(75%-125%)			
Manganese	500		223	727	ug/L		101	(75%-125%)			
Nickel	500	U	ND	489	ug/L		97.6	(75%-125%)			
Potassium	5000		8040	13500	ug/L		109	(75%-125%)			
Silver	500	B	1.07	500	ug/L		99.9	(75%-125%)			
Sodium	5000		28200	32700	ug/L		N/A	(75%-125%)			
Vanadium	500	C	8.78	531	ug/L		105	(75%-125%)			
Zinc	500	C	14.5	514	ug/L		100	(75%-125%)			
QC1203223833 362585001 MSD											
Antimony	500	U	ND	496	ug/L	1.83	99	(0%-20%)		12/10/14	21:04
Arsenic	500	B	5.52	520	ug/L	1.59	103	(0%-20%)			
Barium	500	M	51.1	543	ug/L	2.31	98.3	(0%-20%)			
Cadmium	500	U	ND	493	ug/L	2.18	98.6	(0%-20%)			
Calcium	5000		65400	73100	ug/L	4.96	N/A	(0%-20%)			
Chromium	500	U	ND	482	ug/L	2.68	96.2	(0%-20%)			
Cobalt	500	B	1.15	484	ug/L	1.04	96.7	(0%-20%)			
Copper	500		10.9	499	ug/L	2.74	97.6	(0%-20%)			
Iron	5000	U	ND	5060	ug/L	0.354	101	(0%-20%)			
Magnesium	5000		19400	25400	ug/L	1.66	119	(0%-20%)			
Manganese	500		223	710	ug/L	2.35	97.4	(0%-20%)			

March 9, 2015

Rev. 1

GEL LABORATORIES LLC

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

QC Summary

Workorder: 362583

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1441552										
Nickel	500	U	ND	476	ug/L	2.73	94.9	(0%-20%)	JWJ	12/10/14	21:04
Potassium	5000		8040	13500	ug/L	0.407	110	(0%-20%)			
Silver	500	B	1.07	490	ug/L	2.01	97.9	(0%-20%)			
Sodium	5000		28200	33800	ug/L	3.37	N/A	(0%-20%)			
Vanadium	500	C	8.78	520	ug/L	2.17	102	(0%-20%)			
Zinc	500	C	14.5	501	ug/L	2.56	97.4	(0%-20%)			
QC1203223834 362585001 SDILT											
Antimony		U	ND DU	ND	ug/L	N/A		(0%-10%)		12/10/14	21:06
Arsenic		B	5.52 DU	ND	ug/L	N/A		(0%-10%)			
Barium		M	51.1 DM	11.5	ug/L	12.2*		(0%-10%)			
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Calcium			65400 D	13500	ug/L	3		(0%-10%)			
Chromium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		B	1.15 DU	ND	ug/L	N/A		(0%-10%)			
Copper			10.9 D	3.32	ug/L	52.6		(0%-10%)			
Iron		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Magnesium			19400 D	3980	ug/L	2.34		(0%-10%)			
Manganese			223 D	46.9	ug/L	5.09		(0%-10%)			
Nickel		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Potassium			8040 D	1660	ug/L	3.17		(0%-10%)			
Silver		B	1.07 DU	ND	ug/L	N/A		(0%-10%)			
Sodium			28200 D	5820	ug/L	3.16		(0%-10%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1441552										
Vanadium	C	8.78	D	2.01	ug/L	14.6		(0%-10%)	JWJ	12/10/14	21:06
Zinc	C	14.5	D	3.85	ug/L	32.7		(0%-10%)			

Notes:

The Qualifiers in this report are defined as follows:

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

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

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

* Indicates that a Quality Control parameter was not within specifications.

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

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

General Chem Analysis

Case Narrative

**General Chemistry Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG GEL362583**

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1440692	Method:	9012_CYANIDE: COMMON
Prep Batch :	1440691	Method:	SW846 9010C Distillation

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9012B:

Sample ID	Client ID
362583002	B2YH88
362583004	B2YHC0
1203221642	Method Blank (MB)
1203221643	Laboratory Control Sample (LCS)
1203221644	362379005(B2YHC9) Sample Duplicate (DUP)
1203221645	362379005(B2YHC9) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

Preparation/Analytical Method Verification

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

Calibration Information

The Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 362379005 (B2YHC9).

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

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

Duplicate Relative Percent Difference (RPD) Statement

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203221644 (B2YHC9DUP).

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

All the samples from this sample group met the preservation and integrity requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

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

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1441511 **Method:** 9056_ANIONS_IC: COMMON

Sample Analysis

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

Sample ID	Client ID
362583003	B2YHC1
1203223726	Method Blank (MB)
1203223727	Laboratory Control Sample (LCS)
1203223728	362585002(B2YPL8) Sample Duplicate (DUP)
1203223729	362585002(B2YPL8) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 23.

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 362585002 (B2YPL8).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

Samples 1203223728 (B2YPL8DUP) and 1203223729 (B2YPL8PS) were initially analyzed within holding; however, the holding times had expired prior to reanalysis of diluted samples.

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 1203223728 (B2YPL8DUP), 1203223729 (B2YPL8PS) and 362583003 (B2YHC1). The following samples in this sample group were diluted due to matrix interference: 1203223728 (B2YPL8DUP), 1203223729 (B2YPL8PS) and 362583003 (B2YHC1). The following samples were diluted based on historical data: 1203223728 (B2YPL8DUP), 1203223729 (B2YPL8PS) and 362583003 (B2YHC1).

Sample Re-analysis

The following samples were re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203223726 (MB), 1203223727 (LCS), 1203223728 (B2YPL8DUP), 1203223729 (B2YPL8PS) and 362583003 (B2YHC1).

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

The following DER was generated for this SDG: 1368402. 1203223728 (B2YPL8DUP) and 1203223729 (B2YPL8PS).

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203223728 (B2YPL8DUP), 1203223729 (B2YPL8PS) and 362583003 (B2YHC1).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1443893 **Method:** 2320_ALKALINITY: COMMON (Alkalinity only)

Sample Analysis

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

Sample ID	Client ID
362583002	B2YH88
362583004	B2YHC0
1203229670	Method Blank (MB)
1203229672	Laboratory Control Sample (LCS)
1203229674	362505003(B2YLY3) Sample Duplicate (DUP)
1203229677	362505003(B2YLY3) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 362505003 (B2YLY3).

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

The MS/PS recovery for this sample set was within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

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

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

Additional Comments

50mL of sample was used due to limited quantity. 1203229674 (B2YLY3DUP) and 1203229677 (B2YLY3MS).

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

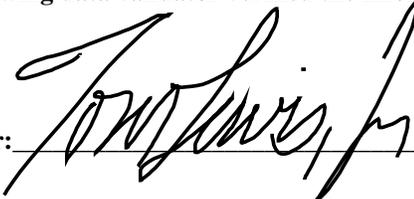
Certification Statement

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

Review Validation:

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

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

Reviewer:  Date: 31Dec14

Sample Data Summary

GEL LABORATORIES LLC

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

**Certificate of Analysis Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL362583 GEL Work Order: 362583

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

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

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

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by



March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YH88	Project:	CPRC0W15012
Sample ID:	362583002	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	05-DEC-14 11:41		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
<i>9012_CYANIDE: COMMON "As Received"</i>											
Cyanide, Total	U	-0.0403	1.67	5.00	ug/L	1	AXH3	12/09/14	0919	1440692	1
57-12-5											
Titration and Ion Analysis											
<i>2320_ALKALINITY: COMMON (Alkalinity only) "As Received"</i>											
Alkalinity, Total as CaCO3		102000	725	1000	ug/L		PXO1	12/16/14	1703	1443893	2
ALKALINITY											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/14	1312	1440691

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9012B	
2	SM 2320B	

March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC1	Project:	CPRC0W15012
Sample ID:	362583003	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	04-DEC-14 13:43		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Ion Chromatography										
<i>9056_ANIONS_IC: COMMON "As Received"</i>										
Fluoride	B	188	+/-12.7	33.0	500	ug/L	1	RXB5 12/06/14 1434	1441511	1
16984-48-8										
Nitrite-N	U	0.00	+/-12.7	38.0	250	ug/L	1			
14797-65-0										
Chloride	D	22100	+/-769	670	2000	ug/L	10	RXB5 12/06/14 1639	1441511	2
16887-00-6										
Nitrate-N	D	6750	+/-250	330	1000	ug/L	10			
14797-55-8										
Sulfate	D	135000	+/-4530	1330	4000	ug/L	10	RXB5 12/11/14 2140	1441511	3
14808-79-8										

The following Analytical Methods were performed

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

March 9, 2015

Certificate of Analysis

Company : CH2MHill Plateau Remediation Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF W15-012**

Report Date: December 30, 2014

Client Sample ID:	B2YHC0	Project:	CPRC0W15012
Sample ID:	362583004	Client ID:	CPRC001
Matrix:	WATER		
Collect Date:	04-DEC-14 13:43		
Receive Date:	06-DEC-14		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Flow Injection Analysis											
<i>9012_CYANIDE: COMMON "As Received"</i>											
Cyanide, Total	B	3.49	1.67	5.00	ug/L	1	AXH3	12/09/14	0920	1440692	1
57-12-5											
Titration and Ion Analysis											
<i>2320_ALKALINITY: COMMON (Alkalinity only) "As Received"</i>											
Alkalinity, Total as CaCO3		102000	725	1000	ug/L		PXO1	12/16/14	1706	1443893	2
ALKALINITY											

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	AXH3	12/08/14	1312	1440691

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9012B	
2	SM 2320B	

Quality Control Summary

March 9, 2015

Rev. 1

GEL LABORATORIES LLC

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QC Summary

Report Date: December 30, 2014

Page 1 of 3

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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Flow Injection Analysis

Batch	1440692										
QC1203221644	362379005	DUP									
Cyanide, Total		U	1.67	U	1.67	ug/L	N/A		AXH3	12/09/14	08:57
QC1203221643	LCS										
Cyanide, Total	50.0				51.7	ug/L		103	(90%-110%)		12/09/14 08:52
QC1203221642	MB										
Cyanide, Total				U	1.67	ug/L					12/09/14 08:51
QC1203221645	362379005	MS									
Cyanide, Total	100	U	1.67		112	ug/L		112	(58%-134%)		12/09/14 08:58

Ion Chromatography

Batch	1441511										
QC1203223728	362585002	DUP									
Chloride		D	19600	D	19600	ug/L	0.245		(0%-20%)	RXB5	12/06/14 18:45
Fluoride		DU	330	DU	330	ug/L	N/A				
Nitrate-N		D	5610	DX	5610	ug/L	0.0891		(0%-20%)		
Nitrite-N		B	46.2	B	46.2	ug/L	0.00	^	(+/-250)		12/06/14 15:36
Sulfate		D	106000	D	104000	ug/L	1.19		(0%-20%)		12/11/14 22:42
QC1203223727	LCS										
Chloride	5000				4800	ug/L		96	(90%-110%)		12/06/14 21:22
Fluoride	2500				2480	ug/L		99.2	(90%-110%)		
Nitrate-N	2500				2450	ug/L		98	(90%-110%)		
Nitrite-N	2500				2510	ug/L		100	(90%-110%)		
Sulfate	10000				9940	ug/L		99.4	(90%-110%)		12/11/14 21:08
QC1203223726	MB										
Chloride				U	67.0	ug/L					12/06/14 20:51
Fluoride				U	33.0	ug/L					

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QC Summary

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1441511										
Nitrate-N			U	33.0	ug/L						
Nitrite-N			U	38.0	ug/L				RXB5	12/06/14	20:51
Sulfate			U	133	ug/L					12/11/14	20:37
QC1203223729	362585002	PS									
Chloride	5.00	D	1.96	D	7.15	mg/L	104	(90%-110%)		12/06/14	19:16
Fluoride	2.50	DU	0.00	D	2.51	mg/L	100	(90%-110%)			
Nitrate-N	2.50	D	0.561	DX	3.08	mg/L	101	(90%-110%)			
Nitrite-N	2.50	B	0.0462		2.53	mg/L	99.5	(90%-110%)		12/06/14	16:08
Sulfate	10.0	D	10.6	D	21.1	mg/L	105	(90%-110%)		12/11/14	23:14
Titration and Ion Analysis											
Batch	1443893										
QC1203229674	362505003	DUP									
Alkalinity, Total as CaCO3			150000		151000	ug/L	0.702	(0%-20%)	PXO1	12/16/14	16:52
QC1203229672	LCS										
Alkalinity, Total as CaCO3	50000				52400	ug/L	105	(90%-110%)		12/16/14	15:50
QC1203229670	MB										
Alkalinity, Total as CaCO3			U	725	ug/L					12/16/14	15:50
QC1203229677	362505003	MS									
Alkalinity, Total as CaCO3	100000		150000		256000	ug/L	106	(80%-120%)		12/16/14	16:59

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.
- 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

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QC Summary

Workorder: 362583

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										

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

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

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

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 24-DEC-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: CPRC
Batch ID: 1441511	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 362583(GEL362583),362585(GEL362585)			
Application Issues: Sample Analyzed out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample Analyzed out of Holding: QC 1203223728DUP,1203223729PS		1. Samples were initially analyzed within holding; however, the holding times had expired prior to reanalysis of diluted samples.	

Originator's Name:
Rachael Bell 24-DEC-14

Data Validator/Group Leader:
Thomas Lewis 30-DEC-14