SAF-RC-008
ERDF Groundwater Well Samples
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

COMMENTS:

SDG X0103 SAF-RC-008

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

ERDF Groundwater Well Samples – April 2015

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

May 07, 2015

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354

Re: RC-008 Water, ERDF March 2015
Work Order: 370755
SDG: X0103

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on April 10, 2015. 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,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 1510
Chain of Custody: RC-008V-008 and RC-008V-020
Enclosures

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Case Narrative

Receipt Narrative
for
Eberline
SDG: X0103
Work Order: 370755

May 07, 2015

Laboratory Identification:

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

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on April 10, 2015 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.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
370755001	B30J73
370755002	B30HX3
370755003	B30HX1

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's 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.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: GC/MS Volatile, General Chemistry and Metals.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

370755

C.O.C. # **RC-008V-020**

Page 1 of 1

Collector	J.C. Fulton CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	RC-008V	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	303361
Project Title	ERDF, MARCH 2015	**Logbook No.**	HNF-N-506 67 / 88	**Ice Chest No.**	GWS-314
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7733 3210 7164
Protocol	CERCLA	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	5557

POSSIBLE SAMPLE HAZARDS/REMARKS

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

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30J73	N	W	4-9-15	0848	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 02	28 Days/48 Hours	Cool <=6C

Relinquished By	Print	Sign	Date/Time
J.C. Fulton CHPRC			APR 09 2015 1030
L.D. Wall CHPRC	L.D. Wall	L.D. Wall	APR 09 2015 1400
FEDEX			

Received By	Print	Sign	Date/Time
L.D. Wall CHPRC	L.D. Wall	L.D. Wall	APR 09 2015 1030
FEDEX			
M. Kinslow			4-10-15 0945

Matrix *

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

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

PRINTED O 3/23/2015

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

3707550

C.O.C. # RC-008V-008

Page 1 of 1

Collector	J.C. Fulton CHPRC	**Contact/Requester**	Karen Waters-Husted	**Telephone No.**	509-376-4650
SAF No.	RC-008V	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	303361
Project Title	ERDF, MARCH 2015	**Logbook No.**	HNF-N-506 67 / 8V	**Ice Chest No.**	GWS-314
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7733 32107164
Protocol	CERCLA	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	5557

POSSIBLE SAMPLE HAZARDS/REMARKS

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

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

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B30HX3	Y	W	4-9-15	0848	1x~~500~~-mL G/P 60 KS 4/9/15	6010_METALS_ICP (Supertrace): WCH LIST	6 Months	HNO3 to pH <2
B30HX1	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool <=6C
B30HX1	N	W			1x~~500~~-mL G/P 250 KS 4/9/15	2540C_TDS: COMMON	7 Days	Cool <=6C
B30HX1	N	W			1x~~500~~-mL G/P 60 KS 4/9/15	6010_METALS_ICP (Supertrace): WCH LIST	6 Months	HNO3 to pH <2
B30HX1	N	W			4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B30HX1	N	W			1x~~1-L~~ aGs* 250-mL KS 4/9/15	9020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C
B30HX1	N	W	4-9-15	0848	1x500-mL G/P	353.2_NO2/NO3: COMMON	28 Days	H2SO4 to pH <2/Cool <=6C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
J.C. Fulton CHPRC			APR 09 2015 1030	L.D. Wall CHPRC		L.D. Wall	APR 09 2015 1030
L.D. Wall CHPRC		L.D. Wall	APR 09 2015 1400	FEDEX			
FedEx				M. Kinslow		M. Kinslow	4-10-15 0945

Matrix *

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

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

PRINTED O 3/23/2015

A-6004-842 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CRC	**SDG/AR/COC/Work Order:** 330755
Received By: MK	**Date Received:** 4-10-15

Suspected Hazard Information	Yes	No
COC/Samples marked as radioactive?		✓
Classified Radioactive II or III by RSO?		✓
COC/Samples marked containing PCBs?		✓
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓
Shipped as a DOT Hazardous?		✓
Samples identified as Foreign Soil?		✓

*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm

If yes, Were swipes taken of sample containers < action levels?

If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.

Hazard Class Shipped: UN#:

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius. 1c 2c
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130532776 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
8	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	✓			ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
12	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
13	Are sample containers identifiable as GEL provided?			✓	
14	COC form is properly signed in relinquished/received sections?	✓			
15	Carrier and tracking number.	✓			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other. see Attached

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HS Date 4/13/15 Page 1 of 1 GL-CHL-SR-001 Rev 1

GEL | Laboratories LLC **SAMPLE RECEIPT & REVIEW CONTINUATION FORM**

Client: CPRC Received By: MC Date Received: 4-10-15 SDG/AR/COC/Work Order: 370755

Fedex #	Temp
7733 2914 0903	2C
0042	2C
0969	1C
0454	1C
3379 6916	2C
6504	1C
3210 7326	2C
7164	1C

PM (or PMA) review: Initials HS Date 4/13/15 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 07 May 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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−15−10
Utah NELAP	SC000122015−17
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
Eberline (WCHN)
SDG #: X0103
Work Order #: 370755

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 8260B
Analytical Batch Number:	1473329

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
370755003	B30HX1
1203304794	Method Blank (MB)
1203304795	Laboratory Control Sample (LCS)
1203304796	370755003(B30HX1) Post Spike (PS)
1203304797	370755003(B30HX1) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

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

Continuing Calibration Verification Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement
The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 370755003 (B30HX1) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement
The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement
The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance
The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications
All samples in this SDG met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Sample Preservation and Integrity
All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation
A data exception reports (DERs) were not generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment
Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments
Additional comments were not required for this SDG.

Residual Chlorine
Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA1.I	Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	RTX-624	Restek, 60m x 0.25mm x 1.4um	Trap 10

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

WCHN001 Eberline

Client SDG: X0103 GEL Work Order: 370755 Project: RC-008 Water, ERDF M

The Qualifiers in this report are defined as follows:

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

T Spike and/or spike duplicate sample recovery is outside control limits.

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

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: Erin Haubert **Name: Erin Haubert**

Date: 06 MAY 2015 **Title: Data Validator**

Sample Data Summary

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

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-008 Water, ERDF March 2015**

Report Date: May 6, 2015
Client SDG: X0103

Client Sample ID: B30HX1
Sample ID: 370755003
Matrix: WATER
Collect Date: 09-APR-15 08:48
Receive Date: 10-APR-15
Collector: Client

Project: WCHN0RC008V
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Volatile Organics										
8260_VOA_GCMS:COMMON "As Received"										
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	VXY1 04/23/15	0149	1473329	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1				
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1				
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1				
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1				
2-Butanone	U	1.50	1.50	10.0	ug/L	1				
4-Methyl-2-pentanone	U	1.50	1.50	10.0	ug/L	1				
Acetone	U	1.50	1.50	20.0	ug/L	1				
Benzene	U	0.300	0.300	5.00	ug/L	1				
Carbon disulfide	U	1.50	1.50	5.00	ug/L	1				
Carbon tetrachloride	J	2.70	0.300	5.00	ug/L	1				
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1				
Chloroform	J	0.740	0.300	5.00	ug/L	1				
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1				
Methylene chloride	U	1.00	1.00	5.00	ug/L	1				
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1				
Toluene	U	0.300	0.300	5.00	ug/L	1				
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1				
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1				
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1				
cis-1,3-Dichloropropylene	U	0.300	0.300	1.00	ug/L	1				
trans-1,3-Dichloropropylene	U	0.300	0.300	1.00	ug/L	1				

Surrogate/Tracer recovery	***Result***	***Nominal***	***Recovery%***	***Acceptable Limits***	***Date Time:***	***04/23/15 01 49***
Toluene-d8	48.5 ug/L	50.0	97.0	(80%-120%)		
Bromofluorobenzene	48.6 ug/L	50.0	97.1	(80%-120%)		
1,2-Dichloroethane-d4	48.8 ug/L	50.0	97.5	(77%-123%)		

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260B	

Quality Control Summary

QC Summary

Report Date: May 6, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **370755** **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1473329										
QC1203304795 LCS										
1,1,1-Trichloroethane	50.0			50.0	ug/L		100	(76%-131%)	VXY1	04/22/15 23:40
1,1,2-Trichloroethane	50.0			46.3	ug/L		92.7	(76%-120%)		
1,1-Dichloroethane	50.0			47.5	ug/L		95	(75%-120%)		
1,1-Dichloroethylene	50.0			43.2	ug/L		86.4	(70%-127%)		
1,2-Dichloroethane	50.0			51.9	ug/L		104	(71%-120%)		
2-Butanone	250			264	ug/L		106	(57%-145%)		
4-Methyl-2-pentanone	250			201	ug/L		80.5	(67%-128%)		
Acetone	250			264	ug/L		105	(55%-147%)		
Benzene	50.0			47.2	ug/L		94.3	(75%-120%)		
Carbon disulfide	250			224	ug/L		89.7	(73%-135%)		
Carbon tetrachloride	50.0			49.1	ug/L		98.2	(76%-135%)		
Chlorobenzene	50.0			45.1	ug/L		90.3	(77%-120%)		
Chloroform	50.0			50.8	ug/L		102	(76%-120%)		
Ethylbenzene	50.0			45.6	ug/L		91.1	(77%-120%)		
Methylene chloride	50.0			45.0	ug/L		90.1	(70%-120%)		
Tetrachloroethylene	50.0			46.1	ug/L		92.3	(73%-125%)		
Toluene	50.0			45.2	ug/L		90.3	(75%-120%)		
Trichloroethylene	50.0			48.5	ug/L		97	(77%-123%)		
Vinyl chloride	50.0			49.3	ug/L		98.7	(62%-126%)		
Xylenes (total)	150			137	ug/L		91.1	(78%-120%)		

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1473329										
cis-1,3-Dichloropropylene	50.0			50.9	ug/L		102	(78%-125%)	VXY1	04/22/15 23:40
trans-1,3-Dichloropropylene	50.0			51.9	ug/L		104	(78%-124%)		
**1,2-Dichloroethane-d4	50.0			48.3	ug/L		96.6	(77%-123%)		
**Bromofluorobenzene	50.0			50.2	ug/L		100	(80%-120%)		
**Toluene-d8	50.0			48.4	ug/L		96.8	(80%-120%)		
QC1203304794 MB										
1,1,1-Trichloroethane			U	0.300	ug/L					04/23/15 01:17
1,1,2-Trichloroethane			U	0.300	ug/L					
1,1-Dichloroethane			U	0.300	ug/L					
1,1-Dichloroethylene			U	0.300	ug/L					
1,2-Dichloroethane			U	0.300	ug/L					
2-Butanone			U	1.50	ug/L					
4-Methyl-2-pentanone			U	1.50	ug/L					
Acetone			U	1.50	ug/L					
Benzene			U	0.300	ug/L					
Carbon disulfide			U	1.50	ug/L					
Carbon tetrachloride			U	0.300	ug/L					
Chlorobenzene			U	0.300	ug/L					
Chloroform			U	0.300	ug/L					
Ethylbenzene			U	0.300	ug/L					
Methylene chloride			U	1.00	ug/L					
Tetrachloroethylene			U	0.300	ug/L					

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch 1473329												
Toluene				U	0.300	ug/L				VXY1	04/23/15	01:17
Trichloroethylene				U	0.300	ug/L						
Vinyl chloride				U	0.300	ug/L						
Xylenes (total)				U	0.300	ug/L						
cis-1,3-Dichloropropylene				U	0.300	ug/L						
trans-1,3-Dichloropropylene				U	0.300	ug/L						
**1,2-Dichloroethane-d4	50.0				48.9	ug/L		97.7	(77%-123%)			
**Bromofluorobenzene	50.0				50.1	ug/L		100	(80%-120%)			
**Toluene-d8	50.0				49.1	ug/L		98.2	(80%-120%)			
QC1203304796 370755003 PS												
1,1,1-Trichloroethane	50.0	U	0.00		53.4	ug/L		107	(71%-133%)		04/23/15	07:10
1,1,2-Trichloroethane	50.0	U	0.00		43.0	ug/L		85.9	(73%-118%)			
1,1-Dichloroethane	50.0	U	0.00		45.7	ug/L		91.4	(71%-122%)			
1,1-Dichloroethylene	50.0	U	0.00		42.6	ug/L		85.2	(65%-129%)			
1,2-Dichloroethane	50.0	U	0.00		52.9	ug/L		106	(67%-123%)			
2-Butanone	250	U	0.00		277	ug/L		111	(30%-145%)			
4-Methyl-2-pentanone	250	U	0.00		205	ug/L		82	(60%-132%)			
Acetone	250	U	0.00		285	ug/L		114	(27%-155%)			
Benzene	50.0	U	0.00		44.2	ug/L		88.4	(71%-118%)			
Carbon disulfide	250	U	0.00		218	ug/L		87.3	(68%-138%)			
Carbon tetrachloride	50.0	J	2.70		52.5	ug/L		99.5	(70%-139%)			
Chlorobenzene	50.0	U	0.00		39.6	ug/L		79.3	(71%-119%)			

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1473329											
Chloroform	50.0	J	0.740		51.6	ug/L		102	(72%-123%)	VXY1	04/23/15 07:10
Ethylbenzene	50.0	U	0.00		38.5	ug/L		76.9	(70%-121%)		
Methylene chloride	50.0	U	0.00		45.0	ug/L		90.1	(68%-119%)		
Tetrachloroethylene	50.0	U	0.00		39.6	ug/L		79.2	(65%-128%)		
Toluene	50.0	U	0.00		40.5	ug/L		81	(69%-119%)		
Trichloroethylene	50.0	U	0.00		47.7	ug/L		95.4	(68%-130%)		
Vinyl chloride	50.0	U	0.00		48.0	ug/L		96	(53%-132%)		
Xylenes (total)	150	U	0.00		114	ug/L		75.8	(71%-122%)		
cis-1,3-Dichloropropylene	50.0	U	0.00		45.7	ug/L		91.4	(73%-125%)		
trans-1,3-Dichloropropylene	50.0	U	0.00		47.7	ug/L		95.4	(73%-125%)		
**1,2-Dichloroethane-d4	50.0		48.8		49.3	ug/L		98.5	(77%-123%)		
**Bromofluorobenzene	50.0		48.6		50.6	ug/L		101	(80%-120%)		
**Toluene-d8	50.0		48.5		47.3	ug/L		94.7	(80%-120%)		
QC1203304797 370755003 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		52.0	ug/L	2.62	104	(0%-20%)		04/23/15 07:42
1,1,2-Trichloroethane	50.0	U	0.00		43.2	ug/L	0.604	86.4	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		45.7	ug/L	0.0219	91.4	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		41.9	ug/L	1.80	83.7	(0%-20%)		
1,2-Dichloroethane	50.0	U	0.00		52.0	ug/L	1.73	104	(0%-20%)		
2-Butanone	250	U	0.00		284	ug/L	2.54	114	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		210	ug/L	2.43	84	(0%-20%)		
Acetone	250	U	0.00		293	ug/L	2.57	117	(0%-20%)		

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1473329											
Benzene	50.0	U	0.00		43.3	ug/L	2.10	86.5	(0%-20%)	VXY1	04/23/15 07:42
Carbon disulfide	250	U	0.00		218	ug/L	0.215	87.2	(0%-20%)		
Carbon tetrachloride	50.0	J	2.70		51.0	ug/L	2.74	96.7	(0%-20%)		
Chlorobenzene	50.0	U	0.00		40.9	ug/L	3.13	81.8	(0%-20%)		
Chloroform	50.0	J	0.740		51.1	ug/L	1.03	101	(0%-20%)		
Ethylbenzene	50.0	U	0.00		39.5	ug/L	2.64	79	(0%-20%)		
Methylene chloride	50.0	U	0.00		43.8	ug/L	2.86	87.5	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		41.5	ug/L	4.64	82.9	(0%-20%)		
Toluene	50.0	U	0.00		40.6	ug/L	0.197	81.2	(0%-20%)		
Trichloroethylene	50.0	U	0.00		48.8	ug/L	2.16	97.5	(0%-20%)		
Vinyl chloride	50.0	U	0.00		49.6	ug/L	3.20	99.2	(0%-20%)		
Xylenes (total)	150	U	0.00		119	ug/L	4.24	79.1	(0%-20%)		
cis-1,3-Dichloropropylene	50.0	U	0.00		45.8	ug/L	0.197	91.6	(0%-20%)		
trans-1,3-Dichloropropylene	50.0	U	0.00		47.0	ug/L	1.50	94	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		48.8		50.3	ug/L		101	(77%-123%)		
**Bromofluorobenzene	50.0		48.6		49.0	ug/L		97.9	(80%-120%)		
**Toluene-d8	50.0		48.5		47.3	ug/L		94.5	(80%-120%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

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

D Results are reported from a diluted aliquot of sample.

E Concentration exceeds the calibration range of the instrument

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

P Aroclor target analyte with greater than 25% difference between column analyses.

T Spike and/or spike duplicate sample recovery is outside control limits.

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

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

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

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

o Analyte failed to recover within LCS limits (0rganics only)

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

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
Eberline (WCHN)
SDG #: X0103
Work Order #: 370755

Sample ID	Client ID
370755002	B30HX3
370755003	B30HX1
1203297037	Method Blank (MB)**ICP**
1203297038	Laboratory Control Sample (LCS)
1203298332	Laboratory Control Sample Duplicate (LCSD)
1203297041	370755002(B30HX3L) Serial Dilution (SD)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1470395
Prep Batch :	1470394
Standard Operating Procedures:	GL-MA-E-013 REV# 23 and GL-MA-E-006 REV# 12
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 P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

Calibration Information

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

CRDL/PQL Requirements
The PQL standard recoveries for SW846 6010C met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected.

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

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

Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement
The relative percent difference (RPD) values obtained from the laboratory control sample (LCS) and duplicate (LCSD) were evaluated based on acceptance criteria of 20%. The RPD values were within the required acceptance limits.

Quality Control (QC) Sample Statement
The following sample was selected as the quality control (QC) sample for this SDG: 370755002 (B30HX3).

Serial Dilution % Difference Statement
All applicable analytes in the serial dilution (SDILT) demonstrated acceptable correlation to its associated sample and met the established acceptance percent difference criteria.

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
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples 370755002 (B30HX3) and 370755003 (B30HX1) required dilutions for tin in order to minimize suppression due to matrix interferences.

Analyte	370755	
	002	003
Tin	5X	5X

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

WCHN001 Eberline

Client SDG: X0103 GEL Work Order: 370755 Project: RC-008 Water, ERDF M

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 >= 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.

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: Pat Steele **Name: Patricia Steele**

Date: 07 MAY 2015 **Title: Data Validator**

Sample Data Summary

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

Certificate of Analysis

Report Date: May 7, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-008 Water, ERDF March 2015
Client SDG: X0103

Client Sample ID: B30HX3
Sample ID: 370755002
Matrix: WATER
Collect Date: 09-APR-15 08:48
Receive Date: 10-APR-15
Collector: Client
Project: WCHN0RC008V
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
6010_METALS_ICP (Supertrace):WCH "As Received"											
Aluminum	U	68.0	68.0	200	ug/L	1	HSC	04/29/15	2316	1470395	1
Antimony	U	3.50	3.50	10.0	ug/L	1					
Arsenic	U	5.00	5.00	30.0	ug/L	1					
Barium		42.7	1.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	ug/L	1					
Calcium		38900	50.0	200	ug/L	1					
Chromium		7.01	1.00	5.00	ug/L	1					
Cobalt	B	2.11	1.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	ug/L	1					
Iron	B	91.2	30.0	100	ug/L	1					
Lead	U	3.30	3.30	10.0	ug/L	1					
Magnesium		12400	110	300	ug/L	1					
Manganese	B	8.65	2.00	10.0	ug/L	1					
Nickel	C	23.6	1.50	5.00	ug/L	1					
Potassium		4570	50.0	150	ug/L	1					
Selenium	U	6.00	6.00	30.0	ug/L	1					
Silver	U	1.00	1.00	5.00	ug/L	1					
Sodium		16800	100	300	ug/L	1					
Vanadium		29.6	1.00	5.00	ug/L	1					
Zinc	B	3.30	3.30	10.0	ug/L	1	HSC	05/01/15	1053	1470395	2
Tin	DU	12.5	12.5	50.0	ug/L	5	HSC	05/01/15	1102	1470395	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JP1	04/13/15	1459	1470394

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6010C	

Notes:

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

Certificate of Analysis

Report Date: May 7, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-008 Water, ERDF March 2015
Client SDG: X0103

Client Sample ID: B30HX1
Sample ID: 370755003
Matrix: WATER
Collect Date: 09-APR-15 08:48
Receive Date: 10-APR-15
Collector: Client
Project: WCHN0RC008V
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
6010_METALS_ICP (Supertrace):WCH "As Received"											
Aluminum	U	68.0	68.0	200	ug/L	1	HSC	04/29/15	2313	1470395	1
Antimony	U	3.50	3.50	10.0	ug/L	1					
Arsenic	U	5.00	5.00	30.0	ug/L	1					
Barium		42.6	1.00	5.00	ug/L	1					
Cadmium	U	1.00	1.00	5.00	ug/L	1					
Calcium		38400	50.0	200	ug/L	1					
Chromium		201	1.00	5.00	ug/L	1					
Cobalt	B	1.69	1.00	5.00	ug/L	1					
Copper	B	4.81	3.00	10.0	ug/L	1					
Iron		950	30.0	100	ug/L	1					
Lead	U	3.30	3.30	10.0	ug/L	1					
Magnesium		12500	110	300	ug/L	1					
Manganese		16.2	2.00	10.0	ug/L	1					
Nickel		89.6	1.50	5.00	ug/L	1					
Potassium		4470	50.0	150	ug/L	1					
Selenium	U	6.00	6.00	30.0	ug/L	1					
Silver	U	1.00	1.00	5.00	ug/L	1					
Sodium		16200	100	300	ug/L	1					
Vanadium		31.6	1.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	ug/L	1	HSC	05/01/15	1050	1470395	2
Tin	DU	12.5	12.5	50.0	ug/L	5	HSC	05/01/15	1059	1470395	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JP1	04/13/15	1459	1470394

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6010C	

Notes:

Quality Control Summary

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

QC Summary

Report Date: May 7, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **370755** **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1470395										
QC1203297038 LCS										
Aluminum	5000			5070	ug/L		101	(80%-120%)	HSC	04/29/15 23:06
Antimony	500			491	ug/L		98.1	(80%-120%)		
Arsenic	500			489	ug/L		97.8	(80%-120%)		
Barium	500			497	ug/L		99.5	(80%-120%)		
Cadmium	500			486	ug/L		97.2	(80%-120%)		
Calcium	5000			5070	ug/L		101	(80%-120%)		
Chromium	500			484	ug/L		96.8	(80%-120%)		
Cobalt	500			482	ug/L		96.4	(80%-120%)		
Copper	500			502	ug/L		100	(80%-120%)		
Iron	5000			4960	ug/L		99.2	(80%-120%)		
Lead	500			500	ug/L		99.9	(80%-120%)		
Magnesium	5000			5060	ug/L		101	(80%-120%)		
Manganese	500			496	ug/L		99.1	(80%-120%)		
Nickel	500			489	ug/L		97.8	(80%-120%)		
Potassium	5000			5110	ug/L		102	(80%-120%)		
Selenium	500			478	ug/L		95.7	(80%-120%)		
Silver	500			497	ug/L		99.4	(80%-120%)		
Sodium	5000			5240	ug/L		105	(80%-120%)		
Tin	500			505	ug/L		101	(80%-120%)		
Vanadium	500			513	ug/L		103	(80%-120%)		

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1470395										
Zinc	500			477	ug/L		95.3	(80%-120%)	HSC	05/01/15 10:44
QC1203298332 LCSD										
Aluminum	5000			5060	ug/L	0.188	101	(0%-20%)		04/29/15 23:10
Antimony	500			492	ug/L	0.338	98.4	(0%-20%)		
Arsenic	500			495	ug/L	1.17	99	(0%-20%)		
Barium	500			502	ug/L	0.943	100	(0%-20%)		
Cadmium	500			492	ug/L	1.15	98.3	(0%-20%)		
Calcium	5000			5090	ug/L	0.238	102	(0%-20%)		
Chromium	500			486	ug/L	0.332	97.1	(0%-20%)		
Cobalt	500			485	ug/L	0.596	97	(0%-20%)		
Copper	500			505	ug/L	0.645	101	(0%-20%)		
Iron	5000			5080	ug/L	2.31	102	(0%-20%)		
Lead	500			504	ug/L	0.781	101	(0%-20%)		
Magnesium	5000			5140	ug/L	1.52	103	(0%-20%)		
Manganese	500			499	ug/L	0.660	99.8	(0%-20%)		
Nickel	500			491	ug/L	0.410	98.2	(0%-20%)		
Potassium	5000			5100	ug/L	0.210	102	(0%-20%)		
Selenium	500			484	ug/L	1.17	96.8	(0%-20%)		
Silver	500			501	ug/L	0.760	100	(0%-20%)		
Sodium	5000			5410	ug/L	3.26	108	(0%-20%)		
Tin	500			507	ug/L	0.223	101	(0%-20%)		
Vanadium	500			517	ug/L	0.740	103	(0%-20%)		

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1470395										
Zinc	500			485	ug/L	1.69	97	(0%-20%)	HSC	05/01/15 10:47
QC1203297037 MB										
Aluminum			U	68.0	ug/L					04/29/15 23:03
Antimony			U	3.50	ug/L					
Arsenic			U	5.00	ug/L					
Barium			U	1.00	ug/L					
Cadmium			U	1.00	ug/L					
Calcium			U	50.0	ug/L					
Chromium			U	1.00	ug/L					
Cobalt			U	1.00	ug/L					
Copper			U	3.00	ug/L					
Iron			U	30.0	ug/L					
Lead			U	3.30	ug/L					
Magnesium			U	110	ug/L					
Manganese			U	2.00	ug/L					
Nickel			B	3.86	ug/L					
Potassium			U	50.0	ug/L					
Selenium			U	6.00	ug/L					
Silver			U	1.00	ug/L					
Sodium			B	168	ug/L					
Tin			U	2.50	ug/L					
Vanadium			U	1.00	ug/L					

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1470395										
Zinc			U	3.30	ug/L				HSC	05/01/15 10:41
QC1203297041 370755002 SDILT										
Aluminum	U	36.5	DU	340	ug/L	N/A		(0%-10%)		04/29/15 23:19
Antimony	U	2.81	DU	17.5	ug/L	N/A		(0%-10%)		
Arsenic	U	1.74	DU	25.0	ug/L	N/A		(0%-10%)		
Barium		42.7	D	8.41	ug/L	1.48		(0%-10%)		
Cadmium	U	0.190	DU	5.00	ug/L	N/A		(0%-10%)		
Calcium		38900	D	7870	ug/L	1.28		(0%-10%)		
Chromium		7.01	D	1.37	ug/L	1.92		(0%-10%)		
Cobalt	B	2.11	DU	5.00	ug/L	N/A		(0%-10%)		
Copper	U	-0.889	DU	15.0	ug/L	N/A		(0%-10%)		
Iron	B	91.2	DU	150	ug/L	N/A		(0%-10%)		
Lead	U	-5.81	DU	16.5	ug/L	N/A		(0%-10%)		
Magnesium		12400	D	2560	ug/L	2.93		(0%-10%)		
Manganese	B	8.65	DU	10.0	ug/L	N/A		(0%-10%)		
Nickel	C	23.6	D	5.03	ug/L	6.6		(0%-10%)		
Potassium		4570	D	916	ug/L	.229		(0%-10%)		
Selenium	U	2.72	DU	30.0	ug/L	N/A		(0%-10%)		
Silver	U	-0.564	DU	5.00	ug/L	N/A		(0%-10%)		
Sodium		16800	D	3530	ug/L	4.99		(0%-10%)		
Tin	DU	-3.91	DU	62.5	ug/L	N/A		(0%-10%)		05/01/15 11:06
Vanadium		29.6	D	5.86	ug/L	.971		(0%-10%)		04/29/15 23:19

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch 1470395											
Zinc	B	3.30	DU	16.5	ug/L	N/A		(0%-10%)	HSC	05/01/15	10:56

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.

Miscellaneous

Prep Logbook

Acid Digestion of Total Recoverable or Dissolved Metals in Surface and Groundwater Samples for Analysis by ICP or ICP-MS

Batch ID: **1470394**
Analyst: James Pressley
Method: SW846 3005A
Lab SOP: GL-MA-E-006 REV# 12
Instrument: Metals Manual Instrument

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203297038	Metals Spike Mix II	UI2219327-06	.25	mL
LCS	1203297038	Metals Spike Mix I	UI2219330-01	.25	mL
LCSD	1203298332	Metals Spike Mix II	UI2219327-06	.25	mL
LCSD	1203298332	Metals Spike Mix I	UI2219330-01	.25	mL

Sample ID	Run Date	Matrix	Initial Volume (mL)	Final Volume (mL)	Prep Factor (mL/mL)	pH Check
1203297037 MB	13-APR-2015 14:59:24	Water	50	50	1	<2
1203297038 LCS	13-APR-2015 14:59:24	Water	50	50	1	<2
1203298332 LCSD	13-APR-2015 14:59:24	Water	50	50	1	<2
370755002	13-APR-2015 14:59:24	Water	50	50	1	<2
1203297041 SDILT (370755002)	13-APR-2015 14:59:24	Water	50	50	1	<2
370755003	13-APR-2015 14:59:24	Water	50	50	1	<2

Reagent/Solvent Lot ID	Description	Amount
150213	HYDROCHLORIC ACID	2.5 mL
2229061	Concentrated Nitric Acid	1 mL

Comments:

Block Temperature: 93 C
Thermometer ID: 61066-a1
Hot Block ID: 8

General Chem Analysis

Case Narrative

General Chemistry
Technical Case Narrative
Eberline (WCHN)
SDG #: X0103
Work Order #: 370755

Method/Analysis Information

Product:	**Total Organic Halogens (TOX)**		
Analytical Batch:	1472051	**Method:**	SW9020B TOX (Organic Halogen)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9020B:

Sample ID	Client ID
370755003	B30HX1
1203301387	Method Blank (MB)
1203301388	Laboratory Control Sample (LCS)
1203301389	370755003(B30HX1) Sample Duplicate (DUP)
1203301390	370755003(B30HX1) 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-007 REV# 14.

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 Halogen analysis was performed on a Mitsubishi AOX-200.

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.

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
Sample370755003 (B30HX1) was selected for QC analysis.

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 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. A data exception report (DER) was not generated for this SDG.

Additional Comments
A pair of nitrate wash blanks is analyzed at the start of the batch. Although they are designated as ICB, they are performed for calculating purposes only. The value of the nitrate wash blanks are averaged and subtracted from all samples. Neither of these values should exceed 0.6 ug Cl. The PQL limit typically applied to ICB results does not apply in this application, since the results are used only to determine background concentrations and are subtracted from all calculated results.
Breakthrough effect
No breakthrough effects were observed for samples in this batch. Breakthrough effect: If the value for a sample is greater than the reporting limit (10 ug/L), the result for the second slug should not be greater than 25% of the

combined value of the first and second slug. Results which do not meet these criteria are designated with a "Fail" comment in the Breakthrough effect column on the Logbook page; however, the "fail" designation is not applicable for samples with a result of less than 10 ug/L.

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:	1470570	**Method:**	9056_ANIONS_IC: COMMON + GW 02

Sample Analysis

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

Sample ID	Client ID
370755001	B30J73
1203297469	Method Blank (MB)
1203297470	Laboratory Control Sample (LCS)
1203297471	370755001(B30J73) Sample Duplicate (DUP)
1203297472	370755001(B30J73) 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# 24.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration
All initial calibration requirements have been met for this SDG.

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

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

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

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
Sample370755001 (B30J73) was selected for QC analysis.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The matrix spike recovered outside of the established acceptance limits due to matrix interference. 1203297472 (B30J73PS).

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 following samples were diluted because target analyte concentrations exceeded the calibration range. 1203297471 (B30J73DUP), 1203297472 (B30J73PS) and 370755001 (B30J73). Samples 1203297471 (B30J73DUP), 1203297472 (B30J73PS) and 370755001 (B30J73) were diluted based on historical data.

Analyte	370755
	001
Chloride	10X
Nitrate	10X
Sulfate	10X

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

Miscellaneous Information

Data Exception (DER) Documentation
A data exception report (DER) 1401125 was generated for sample 1203297472 (B30J73PS) in this SDG/batch.

Manual Integrations
Samples 1203297471 (B30J73DUP), 1203297472 (B30J73PS) and 370755001 (B30J73) were manually integrated to correctly position the baseline as set in the calibration standards.

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:	**Nitrate/Nitrite Cad Redux Low Level**		
Analytical Batch:	1470877	**Method:**	EPA 353.2 Nitrogen, Nitrate/Nitrite

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2 Low Level:

Sample ID	Client ID
370755003	B30HX1
1203298294	Method Blank (MB)
1203298295	Laboratory Control Sample (LCS)
1203298296	370755003(B30HX1) Sample Duplicate (DUP)
1203298297	370755003(B30HX1) 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-128 REV# 8.

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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

Calibration Verification Information
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Continuing Calibration Blanks
All continuing calibration blanks (CCBs) 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
Sample370755003 (B30HX1) was selected for QC analysis.

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 following samples were diluted because target analyte concentrations exceeded the calibration range. 1203298296 (B30HX1DUP), 1203298297 (B30HX1PS) and 370755003 (B30HX1).

Analyte	370755 003
Nitrogen, Nitrate/Nitrite	10X

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
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:	**Solids and Total Dissolved**		
Analytical Batch:	1470738	**Method:**	SM2540C Solids, Dissolved

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SM 2540C:

Sample ID	Client ID
370755003	B30HX1
1203297855	Method Blank (MB)
1203297856	Laboratory Control Sample (LCS)
1203297857	370755003(B30HX1) Sample Duplicate (DUP)

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-001 REV# 15.

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 Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

Initial Calibration
All initial calibration requirements have been met for this SDG.

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
Sample370755003 (B30HX1) was selected for QC analysis.

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.

Sample Aliquot
A sufficient amount of sample was provided by the client for 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
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:	1472991	**Method:**	SM 2320B Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
370755003	B30HX1
1203303925	Method Blank (MB)
1203303926	Laboratory Control Sample (LCS)
1203303927	370755003(B30HX1) Sample Duplicate (DUP)
1203303928	370755003(B30HX1) 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
Sample370755003 (B30HX1) was selected for QC analysis.

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 and selection for QC. 1203303927 (B30HX1DUP), 1203303928 (B30HX1MS) and 370755003 (B30HX1).

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.

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
14-APR-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
IC	SW846 9056A	Liquid	WCHN
Batch ID:	**Sample Numbers:**		
1470570	See Below		

Potentially affected work order(s)(SDG): 370755(X0103)

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Specification and Requirements Exception Description:	**DER Disposition:**
1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203297472PS	1. The matrix spike recovered outside of the established acceptance limits due to matrix interference. 1203297472 (B30J73PS).

Originator's Name:

Rachael Bell 14-APR-15

Data Validator/Group Leader:

Thomas Lewis 07-MAY-15

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0103 GEL Work Order: 370755 Project: RC-008 Water, ERDF M

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.

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: Thomas Lewis**

Date: 07 MAY 2015 **Title: Data Validator**

Sample Data Summary

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

Certificate of Analysis

Report Date: May 7, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-008 Water, ERDF March 2015
Client SDG: X0103

Client Sample ID: B30J73
Sample ID: 370755001
Matrix: WATER
Collect Date: 09-APR-15 08:48
Receive Date: 10-APR-15
Collector: Client
Project: WCHN0RC008V
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON + GW 02 "As Received"											
Bromide	U	0.067	0.067	0.250	mg/L	1	RXB5	04/10/15	2106	1470570	1
Fluoride	B	0.403	0.033	0.500	mg/L	1					
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P	U	0.067	0.067	0.500	mg/L	1					
Chloride	D	12.7	0.670	2.00	mg/L	10	RXB5	04/10/15	2239	1470570	2
Nitrate-N	D	5.83	0.330	1.00	mg/L	10					
Sulfate	D	25.8	1.33	4.00	mg/L	10					

The following Analytical Methods were performed:

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

Notes:

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

Certificate of Analysis

Report Date: May 7, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-008 Water, ERDF March 2015

Client SDG: X0103

Client Sample ID: B30HX1
Sample ID: 370755003
Matrix: WATER
Collect Date: 09-APR-15 08:48
Receive Date: 10-APR-15
Collector: Client

Project: WCHN0RC008V
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Halogen Analysis											
SW9020B TOX (Organic Halogen) "As Received"											
Total Organic Halogens	B	4.46	3.33	10.0	ug/L	1	RMJ	04/17/15	1801	1472051	1
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite	D	6.57	0.070	0.200	mg/L	10	KLP1	04/13/15	1244	1470877	2
Solids Analysis											
SM2540C Solids, Dissolved "As Received"											
Total Dissolved Solids		229	3.40	14.3	mg/L		MXB3	04/14/15	1411	1470738	3
Titration and Ion Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		119	1.45	2.00	mg/L		PXO1	04/23/15	1605	1472991	4

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9020B	
2	EPA 353.2 Low Level	
3	SM 2540C	
4	SM 2320B	

Notes:

Quality Control Summary

QC Summary

Report Date: May 7, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **370755** **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Halogen Analysis											
Batch 1472051											
QC1203301389 370755003 DUP											
Total Organic Halogens		B	4.46	B	4.62	ug/L	3.52 ^		(+/-10.0)	RMJ	04/17/15 18:01
QC1203301388 LCS											
Total Organic Halogens	100				99.8	ug/L		99.8	(75%-118%)		04/17/15 16:46
QC1203301387 MB											
Total Organic Halogens				U	3.33	ug/L					04/17/15 16:23
QC1203301390 370755003 PS											
Total Organic Halogens	100	B	4.46		102	ug/L		97.9	(45%-174%)		04/17/15 18:01
Ion Chromatography											
Batch 1470570											
QC1203297471 370755001 DUP											
Bromide		U	0.067	U	0.067	mg/L	N/A			RXB5	04/10/15 21:37
Chloride		D	12.7	D	12.7	mg/L	0.0392		(0%-20%)		04/10/15 23:10
Fluoride		B	0.403	B	0.404	mg/L	0.322 ^		(+/-0.500)		04/10/15 21:37
Nitrate-N		D	5.83	D	5.79	mg/L	0.534		(0%-20%)		04/10/15 23:10
Nitrite-N		U	0.038	U	0.038	mg/L	N/A				04/10/15 21:37
O-Phosphate as P		U	0.067	U	0.067	mg/L	N/A				
Sulfate		D	25.8	D	25.9	mg/L	0.422		(0%-20%)		04/10/15 23:10
QC1203297470 LCS											
Bromide	1.25				1.30	mg/L		104	(90%-110%)		04/11/15 00:43
Chloride	5.00				4.83	mg/L		96.6	(90%-110%)		
Fluoride	2.50				2.48	mg/L		99	(90%-110%)		
Nitrate-N	2.50				2.45	mg/L		97.9	(90%-110%)		
Nitrite-N	2.50				2.45	mg/L		98.1	(90%-110%)		
O-Phosphate as P	1.25				1.34	mg/L		107	(90%-110%)		

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography											
Batch 1470570											
Sulfate	10.0				9.95	mg/L		99.5	(90%-110%)	RXB5	04/11/15 00:43
QC1203297469 MB											
Bromide				U	0.067	mg/L					04/11/15 00:12
Chloride				U	0.067	mg/L					
Fluoride				U	0.033	mg/L					
Nitrate-N				U	0.033	mg/L					
Nitrite-N				U	0.038	mg/L					
O-Phosphate as P				U	0.067	mg/L					
Sulfate				U	0.133	mg/L					
QC1203297472 370755001 PS											
Bromide	1.25	U	0.0484		1.30	mg/L		100	(90%-110%)		04/10/15 22:08
Chloride	5.00	D	1.27	D	6.09	mg/L		96.3	(90%-110%)		04/10/15 23:41
Fluoride	2.50	B	0.403		2.84	mg/L		97.5	(90%-110%)		04/10/15 22:08
Nitrate-N	2.50	D	0.583	D	3.00	mg/L		96.5	(90%-110%)		04/10/15 23:41
Nitrite-N	2.50	U	0.00		2.42	mg/L		97	(90%-110%)		04/10/15 22:08
O-Phosphate as P	1.25	U	0.0576		1.18	mg/L		89.9*	(90%-110%)		
Sulfate	10.0	D	2.58	D	12.5	mg/L		99.2	(90%-110%)		04/10/15 23:41
Nutrient Analysis											
Batch 1470877											
QC1203298296 370755003 DUP											
Nitrogen, Nitrate/Nitrite		D	6.57	D	6.50	mg/L	1.07		(0%-20%)	KLP1	04/13/15 12:45
QC1203298295 LCS											
Nitrogen, Nitrate/Nitrite	1.00				1.06	mg/L		106	(90%-110%)		04/13/15 12:43
QC1203298294 MB											
Nitrogen, Nitrate/Nitrite				U	0.007	mg/L					04/13/15 12:42
QC1203298297 370755003 PS											

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis												
Batch 1470877												
Nitrogen, Nitrate/Nitrite	1.00	D	0.657	D	1.70	mg/L		104	(90%-110%)		04/13/15	12:51
Solids Analysis												
Batch 1470738												
QC1203297857 370755003 DUP												
Total Dissolved Solids			229		227	mg/L	0.627		(0%-5%)	MXB3	04/14/15	14:11
QC1203297856 LCS												
Total Dissolved Solids	300				299	mg/L		99.5	(95%-105%)		04/14/15	14:11
QC1203297855 MB												
Total Dissolved Solids				U	3.40	mg/L					04/14/15	14:11
Titration and Ion Analysis												
Batch 1472991												
QC1203303927 370755003 DUP												
Alkalinity, Total as CaCO3			119		119	mg/L	0.00		(0%-20%)	PXO1	04/23/15	16:07
QC1203303926 LCS												
Alkalinity, Total as CaCO3	50.0				53.4	mg/L		107	(90%-110%)		04/23/15	15:43
QC1203303925 MB												
Alkalinity, Total as CaCO3				U	0.725	mg/L					04/23/15	15:38
QC1203303928 370755003 MS												
Alkalinity, Total as CaCO3	100		119		225	mg/L		106	(80%-120%)		04/23/15	16:09

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.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

QC Summary

Workorder: 370755 **Client SDG:** X0103 **Project Description:** RC-008 Water, ERDF March

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

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

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