

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4
SAMPLE ID: CASA-13-36990 WORK ORDER: NA
Watershed Sampling SANDIA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/18/2013	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1117	MEDIA:	UA	
PRS ID:		sk	SAMPLE TECH CODE:	UA	GSB
LOCATION ID: R-43 S2			FIELD PREP:	UF	
LOCATION TYPE: MON			FIELD QC TYPE: REG		
PORT: P2A			SAMPLE USAGE: INV		

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen NA mg/L Oxidation-Reduction Potential NA MV pH NA SU
Specific Conductance NA uS/cm Temperature NA deg C Turbidity NA NTU

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 7/18/13 1210	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/18/13 1210
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/01/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling SANDIA
SAMPLE ID: CASA-13-36994 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/18/2013	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1117	MEDIA:	UA	
PRS ID:		ok	SAMPLE TECH CODE:	UA	BSP
LOCATION ID: R-43 S2			FIELD PREP:	F	ok
LOCATION TYPE: MON			FIELD QC TYPE: REG		
PORT: P2A			SAMPLE USAGE: INV		

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
ms	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE	Y	ms
	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen 3.28 mg/L Oxidation-Reduction Potential 66.3 MV pH 8.59 SU
Specific Conductance 145 uS/cm Temperature 20.24 deg C Turbidity 0.0 NTU

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 7/18/10 1210	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/18/13 1210
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/01/2013

Data Validation Report

Chain Of Custody No. 2013-1238

1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
329960	EPA:120.1	1				
329960	EPA:150.1	1				
329960	EPA:160.1	1				
329960	EPA:245.2	1				
329960	EPA:300.0	1				
329960	EPA:310.1	1				
329960	EPA:350.1	1				
329960	EPA:351.2	1				
329960	EPA:353.2	1				
329960	EPA:365.4	1				
329960	SM:A2340B	1				
329960	SW-846:6010B	1				
329960	SW-846:6020	1				
329960	SW-846:6850	1				
329960	SW-846:9060	1				

	Analytical	Analysis	Prep	Regular	Field	Trip	Field	Equipment	Method	Matrix	Matrix
SDG	Method	Lot ID	Lot ID	Samples	Duplicates	Blanks	Blanks	Blanks	Blanks	Spikes	Spike Dups
329960	EPA:120.1	1320710	1320710	1	1						
329960	EPA:150.1	1318847	1318847	1	1						
329960	EPA:160.1	1316395	1316395	1	1					1	
329960	EPA:245.2	1320683	1320681	1	1					1	1
329960	EPA:300.0	1316516	1316516	1	1					1	
329960	EPA:310.1	1318623	1318623	1	1					2	1
329960	EPA:350.1	1319983	1319982	1	1					1	2
329960	EPA:351.2	1315708	1315707	1	1					1	2
329960	EPA:353.2	1317211	1317211	1	1					1	
329960	EPA:365.4	1317225	1317224	1	1					1	2
329960	SM:A2340B	1321813	1321813	1	1						
329960	SW-846:6010B	1320241	1320234	1	1					1	1
329960	SW-846:6020	1320243	1320242	1	1					1	1
329960	SW-846:6850	1316483	1316482	1	1					1	2
329960	SW-846:9060	1316405	1316405	1	1					1	

2. Distribution Of Analytes In EDD.

Analytical Method	Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spikes	TICS
EPA:120.1	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-13-37015	1202923058	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202923061	LCS	0	0	1	0
EPA:120.1	GENERAL CHEMISTRY	WST16-13-36930	1202923453	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-13-36971	1202918636	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36993	1202918635	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202918637	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CASA-13-37015	1202912507	DUP	1	0	0	0

Analytical	Post-Digestion	Lab Control	Lab Control	Blank	Blank	Lab	Storage	Preparation	Reagent
Spikes	Spikes	Samples	Sample Dups	Spikes	Spike Dups	Duplicates	Blanks	Blanks	Blanks
		1					2		
		1					2		
		1					1		
		1					1		
		1					1		
		2					1		
		1					2		
		1					2		
		1					1		
		1					2		
		1					1		
		1					1		
		1							
		1					2		

EPA:160.1	GENERAL CHEMISTRY	LCS	1202912509	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202912506	MB	1	0	0	0
EPA:245.2	INORGANIC	CASA-13-36994	329960002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202922973	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202922972	MB	1	0	0	0
EPA:245.2	INORGANIC	WST55-13-39085	1202922974	DUP	1	0	0	0
EPA:245.2	INORGANIC	WST55-13-39085	1202922975	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-13-36985	1202912901	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202912903	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202912900	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36993	1202918113	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36993	1202918115	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202918117	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202918118	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202918111	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202918112	MB	2	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36992	1202921248	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36992	1202921250	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202921252	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202921247	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WTMSGP-13-39433	1202921249	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WTMSGP-13-39433	1202921251	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36976	1202911679	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36976	1202911680	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36977	1202910856	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36977	1202910857	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CASA-13-36990	329960001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202910855	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202910854	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-13-37047	1202914706	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202914710	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202914705	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36994	1202914750	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36994	1202914752	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36994	329960002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-37021	1202916979	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-37021	1202916980	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202914754	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202914749	MB	1	0	0	0
SM:A2340B	INORGANIC	CASA-13-36994	329960002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CASA-13-36994	329960002	REG	17	0	0	0
SW-846:6010B	INORGANIC	CASA-13-37019	1202921921	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CASA-13-37019	1202921922	MS	0	0	17	0
SW-846:6010B	INORGANIC	LCS	1202921920	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202921919	MB	17	0	0	0
SW-846:6020	INORGANIC	CASA-13-36994	329960002	REG	11	0	0	0
SW-846:6020	INORGANIC	CASA-13-37019	1202921926	DUP	11	0	0	0
SW-846:6020	INORGANIC	CASA-13-37019	1202921927	MS	0	0	11	0
SW-846:6020	INORGANIC	LCS	1202921925	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202921924	MB	11	0	0	0

SW-846:6850	LCMS/MS PERCHLORATE	BDDRIO-13-34203	1202912820	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	BDDRIO-13-34203	1202912821	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-37670	1202912822	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-37670	1202912823	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CASA-13-36994	329960002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202912819	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202912818	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	BDDRIO-13-34239	1202912540	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CASA-13-36990	329960001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CASA-13-37007	1202912539	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202912543	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202912538	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Field	Lab	Type Of	Analytical	Sample	Parameter	Lab	Lab		Lab
Sample ID	Sample ID	Blank	Method	Matrix	Name	Result	Qualifier	Units	Detection Limit
MB	1202910854	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0554 J		mg/L	0.1
MB	1202921247	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0441 J		mg/L	0.05
MB	1202921919	METHOD BLANK	SW-846:6010B	W	Potassium	-82.1 J		ug/L	150
MB	1202921924	METHOD BLANK	SW-846:6020	W	Antimony	-1.7 J		ug/L	3
MB	1202922972	METHOD BLANK	EPA:245.2	W	Mercury	-0.068 J		ug/L	0.2

Any samples affected by the presence of contaminants in blanks?

Field	Blank Field	Blank Lab	Blank	Analytical	Parameter		Blank	Sample	Lab	Detect	
Sample ID	Sample ID	Sample ID	Type	Method	Name	Units	Result	Result	Qualifier	Limit	Detected
CASA-13-36994	MB	1202922972	METHOD BLANK	EPA:245.2	Mercury	ug/L	-0.068	0.2	U	0.2	N
CASA-13-36994	MB	1202921247	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	mg/L	0.0441	0.0654		0.05	Y
CASA-13-36990	MB	1202910854	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	mg/L	0.0554	0.0737	J	0.1	Y
CASA-13-36994	MB	1202921919	METHOD BLANK	SW-846:6010B	Potassium	ug/L	-82.1	1470		150	Y
CASA-13-36994	MB	1202921924	METHOD BLANK	SW-846:6020	Antimony	ug/L	-1.7	3	U	3	N

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

Correction	Correction	Use
Factor (ND)	Factor (J)	Factors
S		Y
S		Y
S		Y
S		Y
S		Y

Field	Matrix	Matrix	Analytical	Parameter	Analysis	Analysis	Sample	MS %	MSD %	Upper	Lower
Sample ID	Spike ID	Spike Dup ID	Method	Name	Lot ID	Date	Matrix	Recvry	Recvry	Limit	Limit
CAMO-13-36977	1202910857		EPA:351.2	Total Kjeldahl Nitrogen	1315707	8/6/2013	W	132		110	90

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

None.

13. Display Flagged Data.

Location ID	Chain Of Custody No	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detected
R-43 S2	2013-1238	CASA-13-36990	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J	U	I4	N
R-43 S2	2013-1238	CASA-13-36994	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N

Reason Code

I4

Description

the sample result is $\leq 5 \times$ the concentration of related analyte in the method blank.

J_LAB

The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL

NQ

The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Useable Result Count.

Field	Location	Sample	Analytical	No. Unuseable	Total No. Of
Sample ID	ID	Purpose	Method	Records	Records
CASA-13-36990	R-43 S2	REG	EPA:351.2	0	1
CASA-13-36990	R-43 S2	REG	SW-846:9060	0	1
CASA-13-36994	R-43 S2	REG	EPA:120.1	0	1
CASA-13-36994	R-43 S2	REG	EPA:150.1	0	1
CASA-13-36994	R-43 S2	REG	EPA:160.1	0	1
CASA-13-36994	R-43 S2	REG	EPA:245.2	0	1
CASA-13-36994	R-43 S2	REG	EPA:300.0	0	4
CASA-13-36994	R-43 S2	REG	EPA:310.1	0	2
CASA-13-36994	R-43 S2	REG	EPA:350.1	0	1

Rejection
Limit
10

RPD

RPD
Limit

Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent Moisture	Analysis Lgt ID	Validation Status Code	Use Flag
0.0737	mg/L	0.0737	mg/L			W	7/18/2013		1315708	VAL	Y
0.0654	mg/L	0.0654	mg/L			W	7/18/2013		1319983	VAL	Y

CASA-13-36994	R-43 S2	REG	EPA:353.2	0	1
CASA-13-36994	R-43 S2	REG	EPA:365.4	0	1
CASA-13-36994	R-43 S2	REG	SM:A2340B	0	1
CASA-13-36994	R-43 S2	REG	SW-846:6010B	0	17
CASA-13-36994	R-43 S2	REG	SW-846:6020	0	11
CASA-13-36994	R-43 S2	REG	SW-846:6850	0	1



August 16, 2013

www.gel.com

Mr. Keith Greene
Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

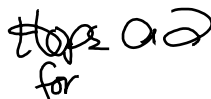
Re: LANL-WQH Water Samples
Work Order: 329960
SDG: 2013-1238

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on July 20, 2013, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. 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. 4485.

Sincerely,



Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2013-1238
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 329960
SDG: 2013-1238

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	4
Data Review Qualifier Flag Definition Sheet.....	13
Perchlorates by LCMSMS Analysis.....	16
Case Narrative.....	17
Sample Data Summary.....	23
Quality Control Summary.....	25
Quality Control Data.....	28
Miscellaneous.....	34
Metals Analysis.....	36
Case Narrative.....	37
Sample Data Summary.....	43
Quality Control Summary.....	48
Miscellaneous.....	62
General Chem Analysis.....	64
Case Narrative.....	65
Sample Data Summary.....	93
Quality Control Summary.....	98
Miscellaneous.....	104

Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 329960
SDG # : 2013-1238**

August 16, 2013

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 July 20, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
329960001	CASA-13-36990
329960002	CASA-13-36994

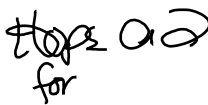
Case Narrative

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: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry, Metals and Perchlorates by LCMSMS.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.



Valerie Davis
Project Manager

List of current GEL Certifications as of 16 August 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Nevada	SC000122011-1
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 Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation

[illegible]

SAMPLE RECEIPT & REVIEW FORM

Client: <u>LANK</u>		SDG/AR/COC/Work Order: <u>2013-1238</u>	
Received By: <u>P. Nest</u>		Date Received: <u>7-22-13</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 cpm</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed? <u>7-22-13</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	CAPA-13-36956 (1-Vial Recd) Circle Applicable: <u>BROKEN</u> Seals broken Damaged container Leaking container Other (describe) WILAP-13-39155 TSS Recd Empty 3, 4 <u>22, 23</u>
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Ice bags <u>Blue ice</u> Dry ice <u>None</u> 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>61524649</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?				Sample ID's affected:
11 Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: <u>SEE Attached Sheet for Information</u>
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	<u>CLIENTS</u>
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>5462-9833-2037-4</u> <u>5462-9833-1990-22</u> <u>5462-9833-2059-3C</u> <u>5462-9833-2026-4C</u> <u>5462-9833-2048-3C</u> <u>5462-9833-2004-23C</u> <u>5462-9833-2015-4C</u>

Comments (Use Continuation Form if needed):

Client: LANL Received By: P. Nert Date Received: 7-22-13 SDG/AR/COC/Work Order: 2013-1238

INC Received a Metals Containers NPD48-13-38787,
did not receive Original chain of custody.

RN- 2013-1244 We did not receive a Gamma Container

RN- 2013-1246

CAPA-13-36952 + 36949 We received 1-8260b Container
Chain indicates 2.

CAPA-13-36956 We received 2-8260b Containers 1-broken

RN 2013-1245

WTLAP-13-31131 INC Received 1-SR90 Container Chain indicates 3.

WTLAP-13-39155 The TSS Container Was received Empty.

WTLAP-13-31123 We received 2-Containers for ISOPU/4 Chain indicates (1)

RN 2013-1242

WTESR-13-33683 We received 1-SR90 Container WTESR-13-33663

We received 2-ISOPU/4/AM241 Containers Chain indicates 3 Each

RN 2013-1256

WTLAP-13-38800 We received 2-Containers Chain indicates 1.

WTLAP-13-38800 We received 3-Containers Chain indicates 1.

RN 2013-1239

WT-IPC-13-32145 We received 3-Gross A Containers
Chain indicates 1.

RN 2013-1249

WTLAP-13-30853 We received 1-Container for SR90 the
Chain indicates 3. WTLAP-13-31079 We received 2-ISOPU/4/AM241
Containers chain indicates 1.

PM (or PMA) review: Initials

Date 7-23-13

Page 2 of 2

Subject: Issues that occurred 07/20/13

From: Pat Dent <Pat.Dent@gel.com>

Date: 7/23/2013 9:33 AM

To: "Keith R. Greene" <kgreene@lanl.gov>

CC: "team.davis" <team.davis@gel.com>, LANL@amrad.com

Listed below are issues from 07/20/13

NP048-13-38787 for Metals was not received, did not receive the original chain of custody.

RN2013-1244 we did not received a Gamma container

RN 2013-1240

CAPA-13-36952 & 36949 The lab received 1 8260b container, chain indicates 2.

CAPA-13-36956 we received 2 8260b containers 1 broken.

RN 2013-1239

WT_IPC-13-32145 we received 3 Gross Alpha containers chain indicates 1

RN2013-1245

WTLAP-13-31131 we received 1 SR90 container chain indicates 3.

WTLAP-13-39155 the TSS container was received empty

WTLAP-13-31123 we received 2 containers for ISOPU/U chain indicates 1.

RN 2013-1242

WTESR-13-33683 we received 1 SR90 container, WTESR-13-33663 we received 2 ISOPU/U /AM241 containers chain indicates 3 each.

RN 2013-1250

WTLAP-13-38800 we received 2 containers chain indicates 1.

WTLAP-13-38802 we received 3 containers chain indicates 1.

RN 2013-1249

WTLAP-13-30853 we received 1 container for SR90 the chain indicates 3.

WTLAP-13-31079 we received 2 containers for ISOPU/U/AM241 the chain indicates 1

Thanks!!

--
Patricia Dent

Project Manager Assistant

GEL Laboratories, LLC

2040 Savage Rd.

Charleston, S.C. 29407

Main: 843-556-8171 Ext 4264

Fax: 843-766-1178

Email: pad@gel.com

Web: www.gel.com

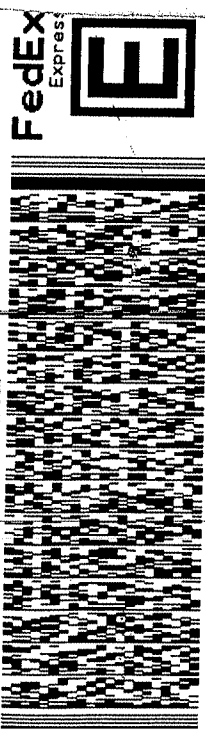
ORIGIN ID: SAFA (505) 665-9966
SHIP DATE: 19 JUL 13
KEITH GREENE
ACTWGT: 51.0 LB MAN
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
CAD: 0014176/CAFE2511

LOS ALAMOS NM 87545
UNITED STATES US
BILL SENDER

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

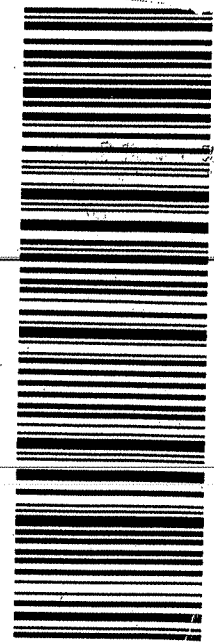
CHARLESTON SC 29407
(843) 556-8171
REF: 6A000AMR0A002068B0

2012



1 of 3
RK# 5462 9833 1990
IN MASTER #
SATURDAY 12:00P
PRIORITY OVERNIGHT

X0 CHSA
29407
SC-US CH

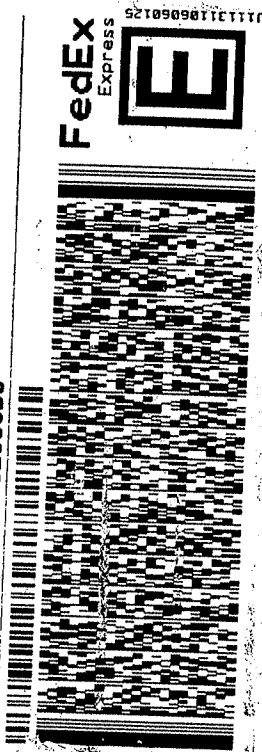


ORIGIN ID: SAFA (505) 665-9966
SHIP DATE: 19 JUL 13
KEITH GREENE
ACTWGT: 51.0 LB MAN
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
CAD: 0014176/CAFE2511

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

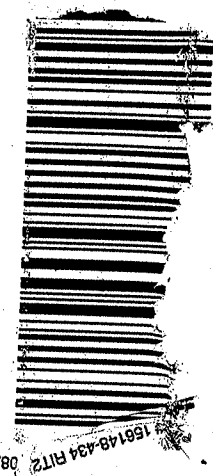
CHARLESTON SC 29407
(843) 556-8171
REF: 6A000AMR0A002068B0

4



2 of 3
MPS# 5462 9833 2037
SATURDAY 12:00P
PRIORITY

X0 CHSA
Ms/r# 5462 9833 2026
0201



3 1 B

2026
07/20

ORIGIN ID: SAFA (505) 865-9966
KEITH GREENE NATL LAB
LOS ALAMOS BLDG 1237 DPU 03
TA00 BLDG 1237 DPU 03

SHIP DATE: 19 JUL 13
ACTWGT: 1.5 0 LB MAN
CAD: 0014176/GAF2511

BILL SENDER

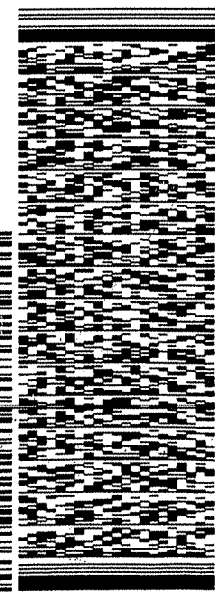
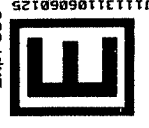
LOS ALAMOS, NM 87545
UNITED STATES US

TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: MR1A015AGWK0

FedEx
Express

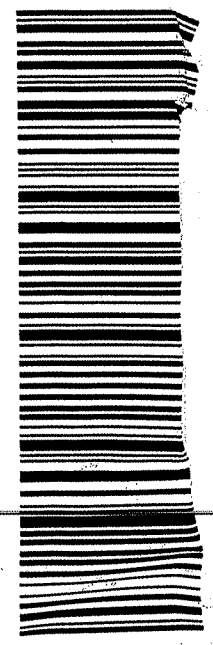


SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 5462 9833 2059
0201

X0 CHSA

29407
SC-US CHS



Part # 150148-434 RIT2 08/10 88

SHIP DATE: 19 JUL 13
ACTWGT: 48 0 LB MAN
CAD: 0014176/GAF2511

ORIGIN ID: SAFA (505) 865-9966
KEITH GREENE NATL LAB
LOS ALAMOS BLDG 1237 DPU 03
TA00 BLDG 1237 DPU 03

BILL SENDER

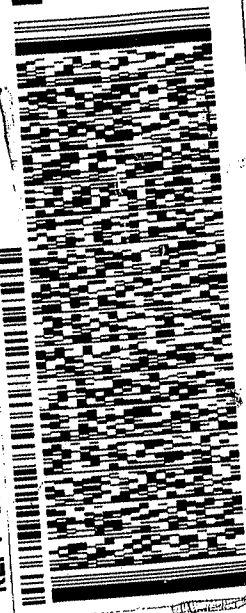
LOS ALAMOS, NM 87545
UNITED STATES US

TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 6A000AMR0A002068B0

FedEx
Express

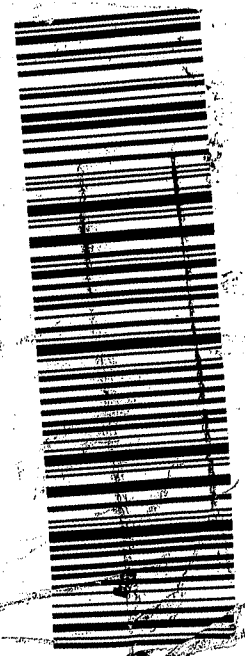


SATURDAY 12:00P
PRIORITY OVERNIGHT

1 of 3
TRK# 5462 9833 2026
MASTER #

2940
SC-US CH

X0 CHSA



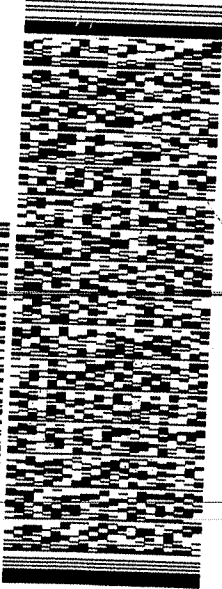
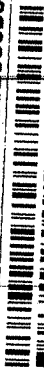
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
1A00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 19JUL13
ACTWGT: 51.3 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 6A000AMR0A00206880



FedEx
Express

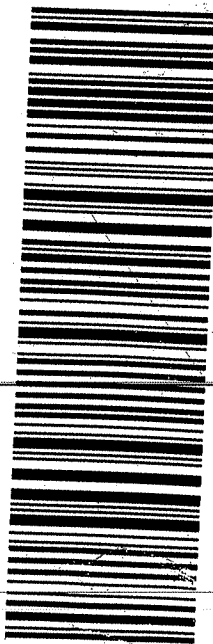


3 of 3
MPS# 5462 9833 2048
Mstr# 5462 9833 2026

X0 CHSA

SATURDAY 12:00P
PRIORITY OVERNIGHT

29407
SC-US CHS



Int # 156148-434 RIT2 08/10 88

ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

SHIP DATE: 19JUL13
ACTWGT: 36.0 LB MAN
CAD: 0014176/CPE2511

LOS ALAMOS NM 87545
UNITED STATES US

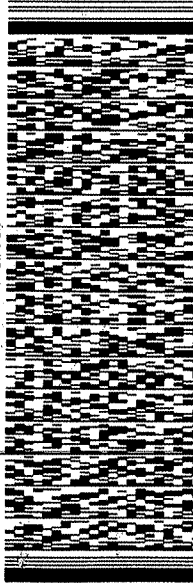
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 6A000AMR0A00206880

FedEx
Express



2 of 3

MPS# 5462 9833 2004

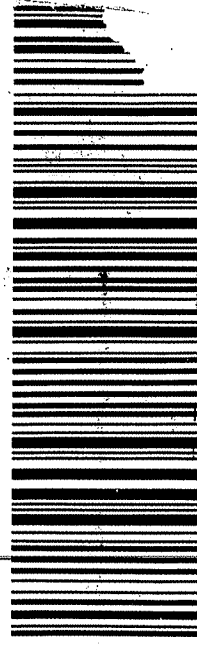
Mstr# 5462 9833 1990

X0 CHSA

SATURDAY 12:00
PRIORITY OVERNIGHT

2940

SC-US CH



Part # 156148-434 RIT2 08/10

ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03

SHIP DATE: 19JUL13
ACTWGT: 36.0 LB MAN
CAD: 0014176/CPE2511

LOS ALAMOS NM 87545
UNITED STATES US

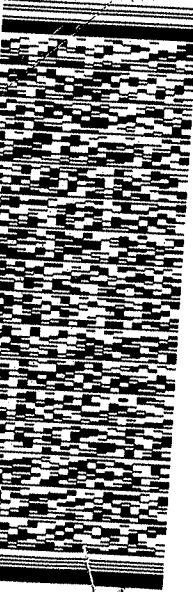
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: 6A000AMR0A00206880

FedEx
Express



3 of 3

MPS# 5462 9833 2015

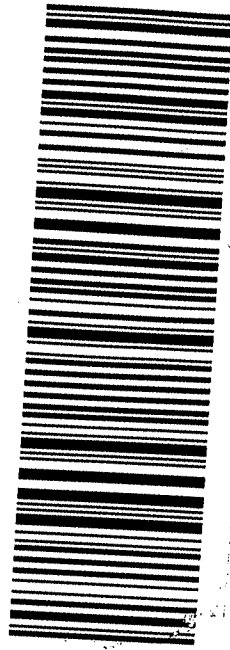
Mstr# 5462 9833 1990

X0 CHSA

SATURDAY 12:00P
PRIORITY OVERNIGHT

29407

SC-US CHS



Part # 156148-434 RIT2 08/10

58DCL/R004/108C

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
-----------	-------------

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC-MS/MS
ARS International (ARSL)
SDG 2013-1238**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1316483

Prep Batch Number: 1316482

Sample Analysis

Sample ID	Client ID
329960002	CASA-13-36994
1202912824	Interference Check Sample (ICS)
1202912818	Method Blank (MB)
1202912819	Laboratory Control Sample (LCS)
1202912822	329643002(CAMO-13-37670) Matrix Spike (MS)
1202912823	329643002(CAMO-13-37670) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

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-067 REV# 10.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

The initial calibration verification standard (ICV) met the acceptance criteria.

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

All low level calibration verification (CRI) requirements were met by all bracketing CRI standards.

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

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 329643002 (CAMO-13-37670) from SDG 2013-1149 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS (1202912822) did not meet spike recovery limits for Perchlorate at -91.2%, and Perchlorate-101 at -163%. The recovery limits are 75-125%. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329643002. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD (1202912823) did not meet spike recovery limits for Perchlorate at 136%, and Perchlorate-101 at 35.9%. The recovery limits are 75-125%. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329643002. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER.

MS/MSD Relative Percent Difference (RPD) Statement

The RPDs between the MS and MSD met the acceptance limits.

Retention Time Standard Area Acceptance

The retention time standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

All samples in this SDG in this analytical batch met the specified holding time. GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of 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.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

QC samples 1202912822 (CAMO-13-37670) and 1202912823 (CAMO-13-37670) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation

Data Exception Report 1205305 was generated for this SDG.

The MS (1202912822) did not meet spike recovery limits for Perchlorate at -91.2%, and Perchlorate-101 at -163%. The recovery limits are 75-125%. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329643002. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER.

The MSD (1202912823) did not meet spike recovery limits for Perchlorate at 136%, and Perchlorate-101 at 35.9%. The recovery limits are 75-125%. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329643002. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

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.

Chromatographic Columns

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

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

ARSL001 ARS International (63641-10)

Client SDG: 2013-1238 GEL Work Order: 329960

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- 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: 

Name: Michael Penny

Date: 01 AUG 2013

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CASA-13-36994Date Received: 20-JUL-13GEL Job No (SDG): 2013-1238GEL Sample ID: 329960002Date Filtered: 23-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.554	ug/L		1	24-JUL-13 19:02	per0724039a
	Perchlorate Isotope Ratio			3.1			1	24-JUL-13 19:02	per0724039a
14797-73-0	Perchlorate-101	.05	.2	0.549	ug/L		1	24-JUL-13 19:02	per0724039a
	Perchlorate-O(18)			0.501	ug/L		1	24-JUL-13 19:02	per0724039a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2013-1238

Extract Batch Code: 1316482

Date Filtered: 23-JUL-13

Matrix: STORM WATER

Sample ID: 1202912819

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.194	ug/L	97.1		85 - 115
Perchlorate Isotope Ratio		3.07				-
Perchlorate-101	0.200	.194	ug/L	97.1		85 - 115
Perchlorate-O(18)		.508	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2013-1238

Extract Batch Code: 1316482

Date Extracted: 23-JUL-13

GEL MS/PS ID: 1202912822

Client ID: CAMO-13-37670

GEL MSD/PSD ID: 1202912823

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	7.85	ug/L	7.67	-91.2 *	8.12	136 *	5.75	30	75 - 125
Perchlorate Isotope Ratio	0	3.06		3.12		3.14		.634		-
Perchlorate-101	0.200	7.88	ug/L	7.56	-163 *	7.95	35.9 *	5.12	30	75 - 125
Perchlorate-O(18)	0	10.4	ug/L	9.85		10.2		3.08		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: STORM WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 23-JUL-13GEL Job No (SDG): 2013-1238GEL Sample ID: 1202912818Date Filtered: 23-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	24-JUL-13 15:41	per0724012a
	Perchlorate Isotope Ratio						1	24-JUL-13 15:41	per0724012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	24-JUL-13 15:41	per0724012a
	Perchlorate-O(18)			0.501	ug/L		1	24-JUL-13 15:41	per0724012a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: STORM WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 23-JUL-13GEL Job No (SDG): 2013-1238GEL Sample ID: 1202912819Date Filtered: 23-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.194	ug/L	J	1	24-JUL-13 15:48	per0724013a
	Perchlorate Isotope Ratio			3.07			1	24-JUL-13 15:48	per0724013a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	24-JUL-13 15:48	per0724013a
	Perchlorate-O(18)			0.508	ug/L		1	24-JUL-13 15:48	per0724013a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-1238GEL Sample ID: 1202912824Date Filtered: 23-JUL-13Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.206	ug/L		1	24-JUL-13 15:56	per0724014a
	Perchlorate Isotope Ratio			3.1			1	24-JUL-13 15:56	per0724014a
14797-73-0	Perchlorate-101	.05	.2	0.205	ug/L		1	24-JUL-13 15:56	per0724014a
	Perchlorate-O(18)			0.511	ug/L		1	24-JUL-13 15:56	per0724014a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-37670MSDate Received: 17-JUL-13GEL Job No (SDG): 2013-1238GEL Sample ID: 1202912822Date Filtered: 23-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	7.67	ug/L		20	24-JUL-13 19:40	per0724044a
	Perchlorate Isotope Ratio			3.12			20	24-JUL-13 19:40	per0724044a
14797-73-0	Perchlorate-101	1	4	7.56	ug/L		20	24-JUL-13 19:40	per0724044a
	Perchlorate-O(18)			9.85	ug/L		20	24-JUL-13 19:40	per0724044a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1316482Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-37670MSDDate Received: 17-JUL-13GEL Job No (SDG): 2013-1238GEL Sample ID: 1202912823Date Filtered: 23-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	1	4	8.12	ug/L		20	24-JUL-13 19:47	per0724045a
	Perchlorate Isotope Ratio			3.14			20	24-JUL-13 19:47	per0724045a
14797-73-0	Perchlorate-101	1	4	7.95	ug/L		20	24-JUL-13 19:47	per0724045a
	Perchlorate-O(18)			10.2	ug/L		20	24-JUL-13 19:47	per0724045a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 25-JUL-13	Division: Federal	Quality Criteria: Specifications	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846 6850 Modified	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1316483	Sample Numbers: 1202912822, 1202912823		
<p>Potentially affected work order(s)(SDG): 329643(2013-1149),329653(2013-1150),329718(2013-1172),329759(2013-1178),329767(2013-1181),329854(2013-1217),329862(2013-1223),329865(2013-1224),329939(2013-1276),329960(2013-1238)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS Failed Recovery for MSD/PSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. The MS (1202912822) did not meet spike recovery limits for Perchlorate at -91.2%, and Perchlorate-101 at -163%. The recovery limits are 75-125%.</p> <p>2. The MSD (1202912823) did not meet spike recovery limits for Perchlorate at 136%, and Perchlorate-101 at 35.9%. The recovery limits are 75-125%.</p>		<p>1. & 2. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329643002. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER. The discrepancies are noted in the case narrative.</p>	

Originator's Name:

Michael Penny 25-JUL-13

Data Validator/Group Leader:

Charles Wilson 31-JUL-13

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 2013-1238**

Sample Analysis

Sample ID	Client ID
329960002	CASA-13-36994
1202921919	Method Blank (MB) ICP
1202921920	Laboratory Control Sample (LCS)
1202921923	330090002(CASA-13-37019L) Serial Dilution (SD)
1202921921	330090002(CASA-13-37019D) Sample Duplicate (DUP)
1202921922	330090002(CASA-13-37019S) Matrix Spike (MS)
1202921924	Method Blank (MB) ICP-MS
1202921925	Laboratory Control Sample (LCS)
1202921928	330090002(CASA-13-37019L) Serial Dilution (SD)
1202921926	330090002(CASA-13-37019D) Sample Duplicate (DUP)
1202921927	330090002(CASA-13-37019S) Matrix Spike (MS)
1202922972	Method Blank (MB) CVAA
1202922973	Laboratory Control Sample (LCS)
1202922976	330076001(WST55-13-39085L) Serial Dilution (SD)
1202922974	330076001(WST55-13-39085D) Sample Duplicate (DUP)
1202922975	330076001(WST55-13-39085S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1320241, 1320243, 1320683 and 1321813
Prep Batch :	1320234, 1320242 and 1320681
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 26 and GL-GC-E-107 REV# 8
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

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 Hardness as CaCO₃ is calculated from Calcium and Magnesium results.

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 a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 6100E inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

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

CRDL Requirements

All CRDL standards met the advisory control limits with the exception of mercury, which recovered outside of the advisory limits of 70-130%.

ICSA/ICSAB Statement

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

Continuing Calibration Blank (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.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 330090002 (CASA-13-37019)-ICP and ICP-MS and 330076001 (WST55-13-39085)-CVAA.

Matrix Spike (MS) 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. All applicable elements met the acceptance criteria.

Duplicate Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the contract required detection limit (RL), a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements with the exception of nickel.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 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. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information

Holding Time Specifications

GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of 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. 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 instruments. Sample 329960002 required a dilution for tin in order to minimize suppression due to matrix interferences.

Preparation Information

Samples for CVAA analysis were prepared at a dilution after the initial KMnO₄ oxidized to a brown precipitate. Additional KMnO₄ was added and resulted in a brown precipitate again. The additional KMnO₄ was also added to the method blank and LCS.

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

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: 1210109. A copy is included in the Miscellaneous Data section

of this package.

Additional Comments

Additional comments were not required for this SDG.

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.


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: 02/13/13

Sample Data Summary

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1238 GEL Work Order: 329960

The Qualifiers in this report are defined as follows:

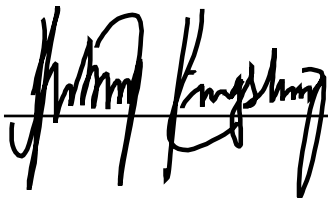
- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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, Valerie Davis.

Reviewed by



02/13/13

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1238**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 329960002**BASIS:** As Received**DATE COLLECTED** 18-JUL-13**CLIENT ID:** CASA-13-36994**LEVEL:** Low**DATE RECEIVED** 20-JUL-13**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	08/08/13 11:04	080813W1-5	1320683

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1238

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 329960002

BASIS: As Received

DATE COLLECTED 18-JUL-13

CLIENT ID: CASA-13-36994

LEVEL: Low

DATE RECEIVED 20-JUL-13

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	08/09/13 13:57	130809-3	1320243
7440-38-2	Arsenic	1.76	ug/L	J	1.7	5	5	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-39-3	Barium	21.3	ug/L		1	5	5	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-42-8	Boron	38.8	ug/L	J	15	50	50	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-70-2	Calcium	17500	ug/L		50	200	200	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-47-3	Chromium	3.98	ug/L	J	2	10	10	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7439-89-6	Iron	35.9	ug/L	J	30	100	100	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7439-95-4	Magnesium	4790	ug/L		110	300	300	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7439-98-7	Molybdenum	1.34	ug/L		0.165	0.5	0.5	1	MS	SKJ	08/09/13 12:22	130809-4	1320243
7440-02-0	Nickel	0.572	ug/L	J	0.5	2	2	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-09-7	Potassium	1470	ug/L		50	150	150	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7631-86-9	Silica	72200	ug/L		53	213	213	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-23-5	Sodium	16100	ug/L		100	300	300	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-24-6	Strontium	110	ug/L		1	5	5	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	08/08/13 18:10	130808-2	1320243
7440-31-5	Tin	100	ug/L	U	25	100	100	10	P	HSC	08/09/13 09:18	080913A-1	1320241
7440-61-1	Uranium	0.918	ug/L		0.067	0.2	0.2	1	MS	SKJ	08/09/13 12:22	130809-4	1320243
7440-62-2	Vanadium	8.17	ug/L		1	5	5	1	P	HSC	08/09/13 08:09	080913A-1	1320241
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	08/09/13 08:09	080913A-1	1320241

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1238**CONTRACT:** ESHL00210**METHOD TYPE:****SAMPLE ID:** 329960002 **BASIS:** As Received **DATE COLLECTED** 18-JUL-13**CLIENT ID:** CASA-13-36994 **LEVEL:** Low **DATE RECEIVED** 20-JUL-13**MATRIX:** W **%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	63.5	mg/L		0.453	1.24	1.24	1		AXH3	08/12/13 12:25		1321813

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1320241	1320234	SW846 3005A	50	mL	50	mL	08/08/13	AXG2
1320243	1320242	SW846 3005A	50	mL	50	mL	08/07/13	AXG2
1320683	1320681	EPA 245.1/245.2 Prep	20	mL	20	mL	08/07/13	AXS5

Analytical Methods:*MS** **SW846 3005/6020 DOE-AL****P** **SW846 3005/6010B****AV** **EPA 245.1/245.2**

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2013-1238

Contract: ESHL00210

Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1202921919								
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	-82.1	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1202921924								
	Antimony	-1.7	ug/L	+/-3	J	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1202922972								
	Mercury	-0.068	ug/L	+/-0.2	J	AV	0.067	0.2

*Analytical Methods:

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1238 Client ID: CASA-13-37019S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 330090002 Spike ID: 1202921922

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Zinc	ug/L	75-125	527		3.3	U	500	105		P
Vanadium	ug/L	75-125	543		3.94	J	500	108		P
Aluminum	ug/L	75-125	5320		68	U	5000	106		P
Barium	ug/L	75-125	541		13.8		500	105		P
Beryllium	ug/L	75-125	547		1	U	500	109		P
Boron	ug/L	75-125	567		53.3		500	103		P
Calcium	ug/L	75-125	23900		18600		5000	106		P
Cobalt	ug/L	75-125	534		1	U	500	107		P
Copper	ug/L	75-125	551		3	U	500	110		P
Iron	ug/L	75-125	5430		30	U	5000	109		P
Magnesium	ug/L	75-125	9300		3860		5000	109		P
Manganese	ug/L	75-125	548		31.2		500	103		P
Potassium	ug/L	75-125	7650		2340		5000	106		P
Silica	ug/L		59300		50400		10700	83.6	N/A	P
Sodium	ug/L	75-125	15000		10300		5000	93.9		P
Strontium	ug/L	75-125	605		74.5		500	106		P
Tin	ug/L	75-125	632		25	U	500	125		P

*Analytical Methods:

P SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1238 **Client ID:** CASA-13-37019S

Contract: ESHL00210 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 330090002 **Spike ID:** 1202921927

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.2		1	U	50	100		MS
Arsenic	ug/L	75-125	49.5		1.7	U	50	96.8		MS
Cadmium	ug/L	75-125	49.1		0.11	U	50	98.2		MS
Chromium	ug/L	75-125	47.6		2	U	50	93.6		MS
Lead	ug/L	75-125	48.2		0.5	U	50	96.4		MS
Molybdenum	ug/L	75-125	51.9		1.5		50	101		MS
Nickel	ug/L	75-125	47.7		3.8		50	87.7		MS
Selenium	ug/L	75-125	52.1		1.5	U	50	102		MS
Silver	ug/L	75-125	49.3		0.2	U	50	98.6		MS
Thallium	ug/L	75-125	43.2		0.45	U	50	86.2		MS
Uranium	ug/L	75-125	53.4		0.453		50	106		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1238 **Client ID:** WST55-13-39085S**Contract:** ESHL00210 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 330076001 **Spike ID:** 1202922975

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	193		6.7	U	200	96.4		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2013-1238

Lab Code: GEL

Contract: ESHL00210

Client ID: CASA-13-37019D

Matrix: LIQUID

Level: Low

Sample ID: 330090002

Duplicate ID: 1202921921

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	13.8		13.7		.502		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	53.3		43.5 J		20.3		P
Calcium	ug/L	+/-20%	18600		18600		.113		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	3860		3860		.0622		P
Manganese	ug/L	+/-10	31.2		31		.708		P
Potassium	ug/L	+/-20%	2340		2390		1.98		P
Silica	ug/L	+/-20%	50400		50400		.0278		P
Sodium	ug/L	+/-20%	10300		10200		.4		P
Strontium	ug/L	+/-20%	74.5		73.9		.876		P
Tin	ug/L		25 U		25 U				P
Vanadium	ug/L	+/-5	3.94 J		4 J		1.53		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005/6010B

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1238

Lab Code: GEL

Contract: ESHL00210

Client ID: CASA–13–37019D

Matrix: LIQUID

Level: Low

Sample ID: 330090002

Duplicate ID: 1202921926

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		1.7 U		1.7 U				MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L		2 U		2 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.5		1.52		.861		MS
Nickel	ug/L	+/- 2	3.8		0.5 U		165	*	MS
Selenium	ug/L		1.5 U		1.5 U				MS
Silver	ug/L		0.2 U		0.2 U				MS
Thallium	ug/L		0.45 U		0.45 U				MS
Uranium	ug/L	+/- .2	0.453		0.46		1.53		MS

*Analytical Methods:

MS SW846 3005/6020 DOE–AL

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1238**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** WST55–13–39085D**Matrix:** LIQUID**Level:** Low**Sample ID:** 330076001**Duplicate ID:** 1202922974**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Mercury	ug/L		6.7	U	6.7	U			AV

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2013-1238

Contract: ESHL00210

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1202921920								
	Aluminum	ug/L	5000	5470		109	80-120	P
	Barium	ug/L	500	546		109	80-120	P
	Beryllium	ug/L	500	549		110	80-120	P
	Boron	ug/L	500	540		108	80-120	P
	Calcium	ug/L	5000	5500		110	80-120	P
	Cobalt	ug/L	500	552		110	80-120	P
	Copper	ug/L	500	551		110	80-120	P
	Iron	ug/L	5000	5500		110	80-120	P
	Magnesium	ug/L	5000	5580		112	80-120	P
	Manganese	ug/L	500	542		108	80-120	P
	Potassium	ug/L	5000	5420		108	80-120	P
	Silica	ug/L	10700	11400		106	80-120	P
	Sodium	ug/L	5000	5360		107	80-120	P
	Strontium	ug/L	500	545		109	80-120	P
	Tin	ug/L	500	553		111	80-120	P
	Vanadium	ug/L	500	550		110	80-120	P
	Zinc	ug/L	500	541		108	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2013-1238

Contract: ESHL00210

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1202921925								
	Antimony	ug/L	50	49.1		98.3	80-120	MS
	Arsenic	ug/L	50	51.2		102	80-120	MS
	Cadmium	ug/L	50	51		102	80-120	MS
	Chromium	ug/L	50	49.3		98.7	80-120	MS
	Lead	ug/L	50	50.7		101	80-120	MS
	Molybdenum	ug/L	50	50.1		100	80-120	MS
	Nickel	ug/L	50	52.4		105	80-120	MS
	Selenium	ug/L	50	53.8		108	80-120	MS
	Silver	ug/L	50	51.1		102	80-120	MS
	Thallium	ug/L	50	48.1		96.3	80-120	MS
	Uranium	ug/L	50	52.4		105	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2013-1238

Contract: ESHL00210

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1202922973	Mercury	ug/L	2	2.05		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1238

Client ID: CASA-13-37019L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 330090002

Serial Dilution ID: 1202921923

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	13.8		13.8	J	.102			P
Beryllium	1	U	5	U				P
Boron	53.3		106	J	99.2			P
Calcium	18600		18400		.874		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3860		3720		3.68			P
Manganese	31.2		30	J	3.75			P
Potassium	2340		2620		11.9			P
Silica	50400		49200		2.38		10	P
Sodium	10300		9710		5.42		10	P
Strontium	74.5		73		2		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.94	J	5	U	100			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005/6010B

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1238

Client ID: CASA-13-37019L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 330090002

Serial Dilution ID: 1202921928

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	1.7	U	8.5	U				MS
Cadmium	.11	U	.55	U				MS
Chromium	2	U	10	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.5		1.84	J	22.1			MS
Nickel	3.8		3.98	J	4.61			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	3.79	J				MS
Uranium	.453		.5	J	10.4			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1238 **Client ID:** WST55-13-39085L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 330076001 **Serial Dilution ID:** 1202922976

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Mercury	.067	U	.335	U				AV

*Analytical Methods:

AV EPA 245.1/245.2

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 09-AUG-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP/MS	Test / Method: SW846 3005/6020 DOE-AL	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1320243	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 329718(2013-1172),329767(2013-1181),329854(2013-1217),329859(2013-1221),329862(2013-1223),329865(2013-1224),329960(2013-1238),330006(2013-1260),330076(2013-1241),330089(2013-1293),330090(2013-1294)</p> <p>Application Issues:</p> <p>Failed RPD for DUP</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed RPD for DUP:</p> <p>QC 1202921926DUP</p>		<p>The sample and sample duplicate % RPD failed outside the control limits for Ni due to possible sample non-homogeneity and/or matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p>	

Originator's Name:
Elizabeth Janssen 09-AUG-13

Data Validator/Group Leader:
Samantha Jacobs 09-AUG-13

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 2013-1238**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1316405

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

Sample ID	Client ID
329960001	CASA-13-36990
1202912538	Method Blank (MB)
1202912540	329939001(BDDRIO-13-34239) Sample Duplicate (DUP)
1202912542	329939001(BDDRIO-13-34239) Post Spike (PS)
1202912543	Laboratory Control Sample (LCS)

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-093 REV# 12.

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 Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

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

The following sample was selected for QC analysis: 329939001 (BDDRIO-13-34239).

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 following samples in this sample group were diluted due to matrix interference: 1202912540 (BDDRIO-13-34239) and 1202912542 (BDDRIO-13-34239).

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 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

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: Specific Conductivity

Analytical Batch: 1320710

Method: EPA120.1 Specific Conductivity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 120.1:

Sample ID	Client ID
329960002	CASA-13-36994
1202923058	329854002(CASA-13-37015) Sample Duplicate (DUP)
1202923061	Laboratory Control Sample (LCS)
1202923453	330751001(WST16-13-36930) 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-009 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 Conductivity analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 329854002 (CASA-13-37015) and 330751001 (WST16-13-36930).

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

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: pH

Analytical Batch: 1318847 **Method:** EPA 150.1 pH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1:

Sample ID	Client ID
329960002	CASA-13-36994
1202918635	329718002(CASA-13-36993) Sample Duplicate (DUP)
1202918636	330006004(CAMO-13-36971) Sample Duplicate (DUP)
1202918637	Laboratory Control Sample (LCS)

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-008 REV# 21.

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 Electrode analysis was performed on a PerpHect pH Meter Orion 370.

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 329718002 (CASA-13-36993) and 330006004 (CAMO-13-36971).

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

The following samples from this sample group were received by the lab outside of the method specified holding time: 1202918635 (CASA-13-36993), 1202918636 (CAMO-13-36971) and 329960002 (CASA-13-36994).

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**

The following DER was generated for this SDG: 1206839 1202918635 (CASA-13-36993), 1202918636 (CAMO-13-36971) and 329960002 (CASA-13-36994).

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: 1316516

Method: EPA 300.0 Anions Liquid 28 day

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 300.0:

Sample ID	Client ID
329960002	CASA-13-36994
1202912900	Method Blank (MB)
1202912901	329653002(CAMO-13-36985) Sample Duplicate (DUP)
1202912902	329653002(CAMO-13-36985) Post Spike (PS)
1202912903	Laboratory Control Sample (LCS)

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# 22.

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

The following sample was selected for QC analysis: 329653002 (CAMO-13-36985).

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.

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202912901 (CAMO-13-36985), 1202912902 (CAMO-13-36985) and 329960002 (CASA-13-36994).

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: Ammonia Nitrogen

Analytical Batch: 1319983 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1319982 **Method:** EEPA 350.2 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 350.1:

Sample ID	Client ID
329960002	CASA-13-36994
1202921247	Method Blank (MB)
1202921248	329546002(CASA-13-36992) Sample Duplicate (DUP)
1202921249	330736001(WTMSGP-13-39433) Sample Duplicate (DUP)
1202921250	329546002(CASA-13-36992) Matrix Spike (MS)
1202921251	330736001(WTMSGP-13-39433) Matrix Spike (MS)
1202921252	Laboratory Control Sample (LCS)

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-106 REV# 9.

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+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

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.

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 samples were selected for QC analysis: 329546002 (CASA-13-36992) and 330736001 (WTMSGP-13-39433).

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

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 following samples were re-analyzed due to CCV failure: 1202921249 (WTMSGP-13-39433) and 1202921251 (WTMSGP-13-39433).

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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1315708	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1315707	Method:	EEPA 351.2 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 351.2:

Sample ID	Client ID
329960001	CASA-13-36990
1202910854	Method Blank (MB)
1202910855	Laboratory Control Sample (LCS)
1202910856	329653001(CAMO-13-36977) Sample Duplicate (DUP)
1202910857	329653001(CAMO-13-36977) Matrix Spike (MS)
1202911679	329377001(CAMO-13-36976) Sample Duplicate (DUP)
1202911680	329377001(CAMO-13-36976) 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-104 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

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 samples were selected for QC analysis: 329377001 (CAMO-13-36976) and 329653001 (CAMO-13-36977).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202910857 (CAMO-13-36977).

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. 1202910856 (CAMO-13-36977) and 1202911679 (CAMO-13-36976).

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**

The following DER was generated for this SDG: 1208720 1202910857 (CAMO-13-36977).

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 by Cadmium Reduction

Analytical Batch: 1317211

Method: EPA 353.2 Nitrogen and Nitrate/Nitrite

Sample Analysis

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

Sample ID	Client ID
329960002	CASA-13-36994
1202914705	Method Blank (MB)
1202914706	329545002(CAMO-13-37047) Sample Duplicate (DUP)
1202914708	329545002(CAMO-13-37047) Post Spike (PS)
1202914710	Laboratory Control Sample (LCS)

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.

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: 329545002 (CAMO-13-37047).

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 following sample in this sample group was diluted due to high concentration: 329960002 (CASA-13-36994).

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:	Total Phosphorus		
Analytical Batch:	1317225	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1317224	Method:	EEPA 365.4 Prep

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 365.4:

Sample ID	Client ID
329960002	CASA-13-36994
1202914749	Method Blank (MB)
1202914750	329960002(CASA-13-36994) Sample Duplicate (DUP)
1202914752	329960002(CASA-13-36994) Matrix Spike (MS)
1202914754	Laboratory Control Sample (LCS)
1202916979	330089003(CASA-13-37021) Sample Duplicate (DUP)
1202916980	330089003(CASA-13-37021) 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-103 REV# 10.

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+ 8000 Series.

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 samples were selected for QC analysis: 329960002 (CASA-13-36994) and 330089003 (CASA-13-37021).

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

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 following samples were re-analyzed due to instrument failure: 1202914749 (MB), 1202914754 (LCS) and 329960002 (CASA-13-36994).

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: 1316395

Method: EPA 160.1 Solids and Dissolved-F

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 160.1:

Sample ID	Client ID
329960002	CASA-13-36994
1202912506	Method Blank (MB)
1202912507	329854002(CASA-13-37015) Sample Duplicate (DUP)
1202912509	Laboratory Control Sample (LCS)

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# 13.

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

The following sample was selected for QC analysis: 329854002 (CASA-13-37015).

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: 1318623 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 310.1:

Sample ID	Client ID
329960002	CASA-13-36994
1202918113	329718002(CASA-13-36993) Sample Duplicate (DUP)
1202918115	329718002(CASA-13-36993) Matrix Spike (MS)
1202918118	Laboratory Control Sample (LCS)

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# 10.

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 analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

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: 329718002 (CASA-13-36993).

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

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.

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:

16Aug13

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1238 GEL Work Order: 329960

The Qualifiers in this report are defined as follows:

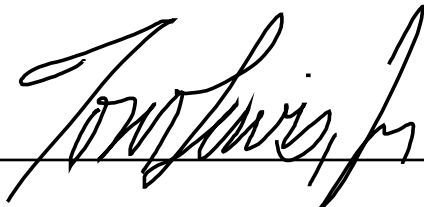
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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, Valerie Davis.

Reviewed by

A handwritten signature in black ink, appearing to read 'Valerie Davis', is written over a horizontal line.

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: August 9, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-1238

Client Sample ID: CASA-13-36990
Sample ID: 329960001
Matrix: W
Collect Date: 18-JUL-13 11:17
Receive Date: 20-JUL-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.525	0.330	1.00	mg/L	1	TSM	07/23/13	2046	1316405	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	J	0.0737	0.033	0.100	mg/L	1	KLP1	08/06/13	1503	1315708	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/05/13	1700	1315707

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: August 9, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-1238

Client Sample ID: CASA-13-36994
Sample ID: 329960002
Matrix: W
Collect Date: 18-JUL-13 11:17
Receive Date: 20-JUL-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		187	1.00	1.00	umhos/cm	1	TXT1	08/07/13	1421	1320710	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 15.2C	H	8.60	0.010	0.100	SU	1	LYG1	07/31/13	0853	1318847	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MAR1	08/02/13	0822	1316516	3
Chloride		4.24	0.067	0.200	mg/L	1					
Fluoride		0.302	0.033	0.100	mg/L	1					
Sulfate		4.91	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0654	0.017	0.050	mg/L	1	KLP1	08/06/13	1340	1319983	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		1.56	0.085	0.250	mg/L	5	KLP1	08/05/13	1308	1317211	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	07/30/13	1604	1317225	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		149	3.40	14.3	mg/L		LYG1	07/22/13	1622	1316395	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		81.1	0.725	1.00	mg/L		LXA1	07/30/13	1655	1318623	8
Carbonate alkalinity (CaCO3)		21.8	0.725	1.00	mg/L						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	08/06/13	1230	1319982
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	07/30/13	1400	1317224

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: August 9, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-1238

Client Sample ID: CASA-13-36994
Sample ID: 329960002

Project: ESHL00210
Client ID: ARSL001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 350.1	
5	EPA 353.2	
6	EPA 365.4	
7	EPA 160.1	
8	EPA 310.1	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: August 9, 2013

Page 1 of 5

Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico
Mr. Keith Greene

Contact:

Workorder: 329960

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1316405										
QC1202912540	329939001	DUP									
Total Organic Carbon Average		5.85		5.87	mg/L	0.239	^	(+/-2.00)	TSM	07/23/13	22:11
QC1202912543	LCS										
Total Organic Carbon Average	10.0			9.78	mg/L			(85%-115%)		07/23/13	17:21
QC1202912538	MB										
Total Organic Carbon Average			U	ND	mg/L					07/23/13	17:12
QC1202912542	329939001	PS									
Total Organic Carbon Average	10.0	2.93		13.1	mg/L			(65%-120%)		07/23/13	22:31
Conductivity Analysis											
Batch	1320710										
QC1202923058	329854002	DUP									
Conductivity		179		182	umhos/cm	1.39		(0%-10%)	TXT1	08/07/13	14:12
QC1202923453	330751001	DUP									
Conductivity		262		264	umhos/cm	0.760		(0%-10%)		08/07/13	14:26
QC1202923061	LCS										
Conductivity	1410			1420	umhos/cm			(95%-105%)		08/07/13	14:09
Electrode Analysis											
Batch	1318847										
QC1202918635	329718002	DUP									
pH		H	7.69	H	7.69	SU	0.00	(0%-10%)	LYG1	07/31/13	08:33
QC1202918636	330006004	DUP									
pH		H	8.37	H	8.37	SU	0.00	(0%-10%)		07/31/13	09:11
QC1202918637	LCS										
pH	7.00			6.95	SU			(99%-101%)		07/31/13	08:30
Ion Chromatography											
Batch	1316516										
QC1202912901	329653002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	08/02/13	02:20
Chloride			3.05		3.05	mg/L	0.226	(0%-20%)			
Fluoride			0.427		0.420	mg/L	1.65	^	(+/-0.100)		

GEL LABORATORIES LLC

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

QC Summary

Workorder: 329960

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1316516										
Sulfate		5.21		5.17	mg/L	0.715		(0%-20%)	MAR1	08/02/13	02:20
QC1202912903 LCS											
Bromide	1.25			1.22	mg/L		97.6	(90%-110%)		08/02/13	01:14
Chloride	5.00			4.90	mg/L		98	(90%-110%)			
Fluoride	2.50			2.53	mg/L		101	(90%-110%)			
Sulfate	10.0			10.0	mg/L		100	(90%-110%)			
QC1202912900 MB											
Bromide			U	ND	mg/L					08/02/13	00:41
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202912902 329653002 PS											
Bromide	1.25	U	ND	1.25	mg/L		95.9	(90%-110%)		08/02/13	02:53
Chloride	5.00		3.05	8.03	mg/L		99.6	(90%-110%)			
Fluoride	2.50		0.427	2.82	mg/L		95.8	(90%-110%)			
Sulfate	10.0		5.21	14.9	mg/L		97.3	(90%-110%)			
Nutrient Analysis											
Batch	1315708										
QC1202910856 329653001 DUP											
Nitrogen, Total Kjeldahl		U	ND	J	0.0756	mg/L	N/A		KLP1	08/06/13	14:50
QC1202911679 329377001 DUP											
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			08/06/13	14:45
QC1202910855 LCS											
Nitrogen, Total Kjeldahl	1.00			0.990	mg/L		99	(90%-110%)		08/06/13	14:44
QC1202910854 MB											
Nitrogen, Total Kjeldahl			J	0.0554	mg/L					08/06/13	14:43
QC1202910857 329653001 MS											

GEL LABORATORIES LLC

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

QC Summary

Workorder: 329960

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1315708										
Nitrogen, Total Kjeldahl	1.00	U	ND	1.32	mg/L		132 *	(90%-110%)		08/06/13	14:51
QC1202911680 329377001 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND	0.919	mg/L		91.9	(90%-110%)	KLP1	08/06/13	14:46
Batch	1317211										
QC1202914706 329545002 DUP											
Nitrogen, Nitrate/Nitrite			0.324	0.320	mg/L	1.24		(0%-20%)	KLP1	08/05/13	13:03
QC1202914710 LCS											
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		08/05/13	13:01
QC1202914705 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					08/05/13	13:00
QC1202914708 329545002 PS											
Nitrogen, Nitrate/Nitrite	1.00		0.324	1.34	mg/L		102	(90%-110%)		08/05/13	13:05
Batch	1317225										
QC1202914750 329960002 DUP											
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A		KLP1	07/30/13	16:00
QC1202916979 330089003 DUP											
Phosphorus, Total as P			2.35	2.24	mg/L	4.79		(0%-20%)		07/30/13	16:11
QC1202914754 LCS											
Phosphorus, Total as P	1.00			1.03	mg/L		103	(79%-126%)		07/30/13	16:03
QC1202914749 MB											
Phosphorus, Total as P			U	ND	mg/L					07/30/13	16:02
QC1202914752 329960002 MS											
Phosphorus, Total as P	1.00	U	ND	1.07	mg/L		107	(64%-134%)		07/30/13	16:01
QC1202916980 330089003 MS											
Phosphorus, Total as P	1.00		2.35	3.34	mg/L		99	(64%-134%)		07/30/13	16:12
Batch	1319983										
QC1202921248 329546002 DUP											
Nitrogen, Ammonia			0.0986	0.113	mg/L	13.6 ^		(+/-0.050)	KLP1	08/06/13	13:35
QC1202921249 330736001 DUP											
Nitrogen, Ammonia			0.663	0.642	mg/L	3.22		(0%-20%)		08/06/13	14:43
QC1202921252 LCS											
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)		08/06/13	13:33
QC1202921247 MB											

GEL LABORATORIES LLC

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

QC Summary

Workorder: 329960

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1319983										
Nitrogen, Ammonia			J	0.0441	mg/L				KLP1	08/06/13	13:33
QC1202921250 329546002 MS											
Nitrogen, Ammonia	1.00	0.0986		1.18	mg/L		108	(90%-110%)		08/06/13	13:36
QC1202921251 330736001 MS											
Nitrogen, Ammonia	1.00	0.663		1.62	mg/L		95.7	(90%-110%)		08/06/13	14:44
Solids Analysis											
Batch	1316395										
QC1202912507 329854002 DUP											
Total Dissolved Solids		149		139	mg/L	6.97		(0%-10%)	LYG1	07/22/13	15:39
QC1202912509 LCS											
Total Dissolved Solids	300			290	mg/L		96.7	(95%-105%)		07/22/13	15:39
QC1202912506 MB											
Total Dissolved Solids			U	ND	mg/L					07/22/13	15:39
Titration Analysis											
Batch	1318623										
QC1202918113 329718002 DUP											
Alkalinity, Total as CaCO3		42.6		43.2	mg/L	1.21		(0%-20%)	LXA1	07/30/13	15:12
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202918118 LCS											
Alkalinity, Total as CaCO3	50.0			51.5	mg/L		103	(90%-110%)		07/30/13	15:03
QC1202918115 329718002 MS											
Alkalinity, Total as CaCO3	50.0	42.6		93.6	mg/L		102	(80%-120%)		07/30/13	15:14

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative
 - ND Analyte concentration is not detected above the detection limit

GEL LABORATORIES LLC

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

QC Summary

Workorder: 329960

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

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

^ 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. 31-JUL-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1318847	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 329718(2013-1172),329748(2013-1177),329767(2013-1181),329854(2013-1217),329855(2013-1218),329857(2013-1219),329862(2013-1223),329865(2013-1224),329960(2013-1238),329961(2013-1239),329963(2013-1242),329965(2013-1245),329966(2013-1247),330006(2013-1260) Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 329718 002 329748 014 329767 002 329854 002,004,007 329855 001 329857 001 329862 002 329865 002 329960 002 329961 002,004,007,009 329963 007 329965 007 329966 007 330006 002,004 QC 1202918635DUP,1202918636DUP		1. Sample received out of holding	

Originator's Name:

Lisa Gregory 31-JUL-13

Data Validator/Group Leader:

Jamie Johnson 07-AUG-13

DATA EXCEPTION REPORT

Mo.Day Yr. 06-AUG-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1315708	Sample Numbers: See below.		
<p>Potentially affected work order(s)(SDG): 329377(2013-1101),329545(2013-1128),329546(2013-1129),329653(2013-1150),329718(2013-1172),329767(2013-1181),329854(2013-1217),329862(2013-1223),329865(2013-1224),329903,329960(2013-1238),330006(2013-1260),330074,330087(2013-1292),330089(2013-1293),330090(2013-1294),330453(2013-1370)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS:</p> <p>QC 1202910857MS</p>		<p>1. The spike recovery falls outside of the established acceptance limits due to matrix interference.</p>	

Originator's Name:

Kristen Parson 06-AUG-13

Data Validator/Group Leader:

Julia Hamilton 06-AUG-13