

General Engineering Laboratories, Inc., Charleston, SC.  
2040 Savage Rd  
Charleston SC 29407

## Chain of Custody/Analysis Request

COC/Lab Request #:

2013-1101

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Site Name: Los Alamos National Laboratory

Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐

7 Day - ☐

14 Day - ☐

21 Day - ☐

28 Day - ☒

WSP-GENINORG+PerChlorate

WSP-Met+B+SN+SR+U

WSP-NH3+NO3/NO2+PO4

WSP-TKN+TOC

Rad Screening Info:

Yes, Below Background

Lab Reporting Limit Type:

Special Instructions:

Field Sample ID

Sample Date

Sample Time

Sample Matrix

CAMO-13-36976

Jul 10 2013

13:10

W

CAMO-13-36984

Jul 10 2013

13:10

W

1

1

1

1

Special Instructions:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4302 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling\_MORTANDAD

SAMPLE ID: CAMO-13-36976 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/10/2013	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1310	MEDIA:	UA	
PRS ID:			SAMPLE TECH CODE:	UA	
LOCATION ID: R-50 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:

NA

## 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)

A. Stocker, M. Shewell, J. Jordan

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 7/10/13 1355	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/10/13 1355
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: 4302 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling\_MORTANDAD

SAMPLE ID: CAMO-13-36984 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/10/2013	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1310	MEDIA:	UA	
PRS ID:		ok	SAMPLE TECH CODE:	UA	BSI
LOCATION ID: R-50 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
NA	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE	Y	NA
	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

## SAMPLE COMMENTS:

NA

## LOCATION COMMENTS:

diesel generator running 40' away

## FIELD PARAMETERS:

Dissolved Oxygen 7.12 mg/L      Oxidation-Reduction Potential 87.8 MV      pH 7.88 SU  
 Specific Conductance 132 uS/cm      Temperature 21.82 deg C      Turbidity 4.8 NTU

## COLLECTED BY (PRINT)

M. Shendo, J. Jordan

RELINQUISHED BY (Printed Name) <u>Andrew Shendo</u> (Signature) <u>[Signature]</u>	Date/Time <u>7/10/13</u> <u>1355</u>	RECEIVED BY (Printed Name) <u>J. Sherwood</u> (Signature) <u>[Signature]</u>	Date/Time <u>7/10/13</u> <u>1355</u>
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. 2013-1101

## 1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
329377	EPA:120.1	1				
329377	EPA:150.1	1				
329377	EPA:160.1	1				
329377	EPA:245.2	1				
329377	EPA:300.0	1				
329377	EPA:310.1	1				
329377	EPA:350.1	1				
329377	EPA:351.2	1				
329377	EPA:353.2	1				
329377	EPA:365.4	1				
329377	SM:A2340B	1				
329377	SW-846:6010B	1				
329377	SW-846:6020	1				
329377	SW-846:6850	1				
329377	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
329377	EPA:120.1	1318512	1318512		1						
329377	EPA:150.1	1314715	1314715		1						
329377	EPA:160.1	1314710	1314710		1					1	
329377	EPA:245.2	1318196	1318193		1					1	1
329377	EPA:300.0	1314143	1314143		1					1	
329377	EPA:310.1	1316484	1316484		1					2	1
329377	EPA:350.1	1314770	1314769		1					1	1
329377	EPA:351.2	1315708	1315707		1					1	2
329377	EPA:353.2	1314793	1314793		1					1	
329377	EPA:365.4	1313807	1313806		1					1	2
329377	SM:A2340B	1320801	1320801		1						
329377	SW-846:6010B	1315157	1315156		1					1	1
329377	SW-846:6020	1315155	1315154		1					1	1
329377	SW-846:6850	1315482	1315481		1					1	1
329377	SW-846:9060	1317001	1317001		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	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-13-37046	1202917840	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202917841	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-13-36983	1202908480	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202908483	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-13-37046	1202908470	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202908472	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202908469	MB	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				1			
		1				1			
		1				1			
		1				1			
		1				1			
		2				1			
		1				1			
		1				2			
		1				1			
		1				2			
		1				1			
		1				1			
		1							
		1				1			



EPA:245.2	INORGANIC	CAMO-13-36984	1202916999	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-13-36984	1202917000	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202916998	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202916997	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-13-36980	1202907194	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202907196	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202907193	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-13-36983	1202912831	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-13-36983	1202912833	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202912834	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202913503	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202912829	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202913502	MB	2	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-13-36984	1202908628	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-13-36984	1202908629	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202908627	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202908626	MB	1	0	0	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-13-36976	329377001	REG	1	0	0	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	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-13-36983	1202908680	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202908687	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202908678	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-13-36980	1202906423	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-13-36980	1202906424	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-13-36984	329377002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202906422	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202906421	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	NP048-13-38787	1202910151	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	NP048-13-38787	1202910152	MS	0	0	1	0
SM:A2340B	INORGANIC	CAMO-13-36984	329377002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CAMO-13-36984	1202909596	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CAMO-13-36984	1202909597	MS	0	0	17	0
SW-846:6010B	INORGANIC	CAMO-13-36984	329377002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202909595	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202909594	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-13-36984	1202909591	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-13-36984	1202909592	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-13-36984	329377002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202909590	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202909589	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-36980	1202910328	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-36980	1202910329	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-36984	329377002	REG	1	0	0	0



SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202910327	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202910326	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-13-36976	1202914125	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-13-36976	329377001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202914127	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202914124	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	1202908626	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0337	J	mg/L	0.05
MB	1202909589	METHOD BLANK	SW-846:6020	W	Molybdenum	0.177	J	ug/L	0.5
MB	1202916997	METHOD BLANK	EPA:245.2	W	Mercury	-0.113	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
CAMO-13-36984	MB	1202916997	METHOD BLANK	EPA:245.2	Mercury	ug/L	-0.113	0.2	U	0.2	N
CAMO-13-36984	MB	1202908626	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	mg/L	0.0337	0.0318	J	0.05	Y

## 6. Any surrogate recoveries outside the control limits?

No.

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

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-13-36984	1202908629		EPA:350.1	Ammonia as Nitrogen	1314769	7/18/2013	W	87.1		110	90
CAMO-13-36984	1202908629		EPA:350.1	Ammonia as Nitrogen	1314769	7/18/2013	W	87.1		110	90
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.



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

Rejection	RPD	Limit
Limit		
10		
10		
10		

## 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-50 S2	2013-1101	CAMO-13-36984	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	14	N

## Reason Code

Description

14

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 qualify. 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
CAMO-13-36976	R-50 S2	REG	EPA:351.2	0	1
CAMO-13-36976	R-50 S2	NEG	SW-846:9060	0	1
CAMO-13-36984	R-50 S2	REG	EPA:120.1	0	1
CAMO-13-36984	R-50 S2	NEG	EPA:150.1	0	1
CAMO-13-36984	R-50 S2	REG	EPA:160.1	0	1
CAMO-13-36984	R-50 S2	NEG	EPA:245.2	0	1
CAMO-13-36984	R-50 S2	NEG	EPA:300.0	0	4
CAMO-13-36984	R-50 S2	REG	EPA:310.1	0	2
CAMO-13-36984	R-50 S2	NEG	EPA:350.1	0	1
CAMO-13-36984	R-50 S2	REG	EPA:353.2	0	1
CAMO-13-36984	R-50 S2	NEG	EPA:365.4	0	1
CAMO-13-36984	R-50 S2	REG	SM:A2340B	0	1
CAMO-13-36984	R-50 S2	NEG	SW-846:6010B	0	7
CAMO-13-36984	R-50 S2	REG	SW-846:6020	0	11
CAMO-13-36984	R-50 S2	REG	SW-846:6850	0	1

Lab Result	Lab Units	Report Result	Report Units	Report MD/A	Report Uncertainty	Lab Matrix	Sample Date	Percent Moisture	Analysis Lot ID	Validation Status Code	Use Flag
0.0318	mg/L	0.0318	mg/L			W	7/10/2013		131470	V,AL	Y





August 08, 2013

[www.gel.com](http://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: 329377  
SDG: 2013-1101

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on July 12, 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: 2013-1101  
Enclosures



**ARS International (63641-10)**  
**LANL-WQH Water Samples**  
**Work Order #: 329377**  
**SDG: 2013-1101**

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# Case Narrative

**Case Narrative for  
ARS International (63641-10)  
LANL-WQH Water Samples  
Workorder #: 329377  
SDG # : 2013-1101**

**August 08, 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 12, 2013 for analysis. Please see attached email for discrepancies. 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>
329377001	CAMO-13-36976
329377002	CAMO-13-36984

**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.

*Top 2  
for*

Valerie Davis  
Project Manager

**List of current GEL Certifications as of 08 August 2013**

<b>State</b>	<b>Certification</b>
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**

COC/Lab Request #: 2013-1101  
Page 1 of 1

[illegible]

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>L.A.N.H.</u>		SDG/AR/COC/Work Order: <u>2013-1101</u>	
Received By: <u>P. Went</u>		Date Received: <u>7-12-13</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?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0CPM</u>
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>61524649</u>
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?				Sample ID's, containers affected and observed pH: <u>WT, IPC-13-3222 For Gross A/B</u> If Preservation added, Lot#: <u>17341</u>
6 VOA vials free of headspace (defined as < 6mm bubble)?	X			Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?			X	<u>Please see Continuation Sheet for Details</u>
12 Are sample containers identifiable as GEL provided?			X	<u>clients</u>
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5462 9833 1545-3</u> <u>5462 9833 1567-4</u> <u>5462 9833 1578-4</u> <u>5462 9833 1523-5</u> <u>5462 9833 1534-5</u> <u>5462 9833 1556-5</u> <u>5462 9833 1512-17</u>

Comments (Use Continuation Form if needed):

Client: LANH Received By: P. Hent Date Received: 7-12-13 SDG/AR/COC/Work Order: \_\_\_\_\_

Container Received For Gross A/B Was Preserved Prior to analysis.

P0713.09 + CAMO-13-37052 For 82608 the Lab rec'd 1. Container each chain indicates 2. each.

WST46-13-38775 For O+G the Lab rec'd 2. Containers the Chain indicates 3.

WTLAP-13-31129 + 31130 For SR-90 the Lab rec'd 1. Container each, the Chain indicates 3 each.

WTLAP-13-31121 + 31122 For ISOPU/u the Lab rec'd 2 Containers each the Chain indicates 1 each.

WT-IPC-13-32222 For R9226/R9228 the Lab rec'd 2 Containers, the Chain indicates 4.

The Lab did not receive a TKN+TOC Container For CAMO-13-36975.<sup>TH</sup>  
36976

The Following Sample Containers Was Received in Lab Without chain of Custody

CAWR-13-34738 For TKN+TOC

WST43-13-38776 For COD, TDS+TSS + D&G.

**Subject:** RE: Fwd: RE: Fwd: Re: Sample Receipt Issues from 07/12/13  
**From:** "Greene, Keith R" <[kgreene@lanl.gov](mailto:kgreene@lanl.gov)>  
**Date:** 7/23/2013 12:36 PM  
**To:** Hope Taylor <[Hope.Taylor@gel.com](mailto:Hope.Taylor@gel.com)>

[Yes log 34738 as 36976](#)

---

**From:** Hope Taylor [<mailto:Hope.Taylor@gel.com>]  
**Sent:** Tuesday, July 23, 2013 6:35 AM  
**To:** Greene, Keith R  
**Subject:** Fwd: Fwd: RE: Fwd: Re: Sample Receipt Issues from 07/12/13

We actually did have the sample for **CAMO-13-36975**, There was a typo in the email. We did not get a container for ID **CAMO-13-36976**. Do you still want me to use **CAWR-13-34738**.

We did not get the chains for WST43.

Thanks

----- Original Message -----

**Subject:** RE: Fwd: Re: Sample Receipt Issues from 07/12/13  
**Date:** Thu, 18 Jul 2013 18:49:32 +0000  
**From:** Greene, Keith R <[kgreene@lanl.gov](mailto:kgreene@lanl.gov)>  
**To:** Hope Taylor <[Hope.Taylor@gel.com](mailto:Hope.Taylor@gel.com)>

[Yes you will get coc for wst43 tomorrow and please log 34738 as 36975, txs](#)

---

**From:** Hope Taylor [<mailto:Hope.Taylor@gel.com>]  
**Sent:** Thursday, July 18, 2013 10:43 AM  
**To:** Greene, Keith R  
**Subject:** Re: Fwd: Re: Sample Receipt Issues from 07/12/13

Should we cancel the TKN+TOC for **CAMO-13-36975** and will we be receiving a chain of custody for **CAWR-13-34738** for TKN+TOC  
**WST43-13-38776** for COD,TDS+TSS & O&G. Please advise.

On 7/17/2013 3:47 PM, Hope Taylor wrote:

RN#2013-1101

CAMO-13-36975 the lab did not receive a TKN+TOC container, Please advise.

**The following Sample containers was received in lab not listed on any chain of custody.**  
**CAWR-13-34738** for TKN+TOC



**WST43-13-38776 for COD,TDS+TSS & O&G Please advise.**

On 7/12/2013 6:07 PM, Pat Dent wrote:

Good Evening all listed below are today's issues 07/12/13

The container received for Gross A/B was preserved prior to analysis.

The lab received 1 8260b container the chain indicates 2 for P0713.09

RN#2013-1108

WST46-13-38775 the lab received 2- O&G containers the chain indicates 3.

RN#2013-1104

WTLAP-13-31129 & 31130 the lab received 1 SR-90 container each, the chain indicates 3 each.

WTLAP-13-21121 & 31122 the lab received 2 Isopu/U containers each, the chain indicates 1 each.

RN#2013-1100

CAMO-13-37052 the lab received 1 8260b container the chain indicates 2.

**RN#2013-1101**

**CAMO-13-36975 the lab did not receive a TKN+TOC container,  
Please advise.**

RN#2013-1105

WT\_IPC-13-32222 the lab received 2 Ra226/Ra228 containers the chain indicates 4.

The following Sample containers was received in lab not listed on any chain of custody.

CAWR-13-34738 for TKN+TOC

WST43-13-38776 for COD,TDS+TSS & O&G Please advise!

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](mailto:pad@gel.com)  
Web: [www.gel.com](http://www.gel.com)

--  
Hope Taylor  
Project Manager Assistant  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407  
Direct: 843.769.7376 ext. 4778  
Main: 843.556.8171  
Fax: 843.766.1178  
E-mail: [hop01200@gel.com](mailto:hop01200@gel.com)  
Web: [www.gel.com](http://www.gel.com)

--  
Hope Taylor  
Project Manager Assistant  
GEL Laboratories, LLC  
2040 Savage Road  
Charleston, SC 29407  
Direct: 843.769.7376 ext. 4778  
Main: 843.556.8171  
Fax: 843.766.1178  
E-mail: [hop01200@gel.com](mailto:hop01200@gel.com)  
Web: [www.gel.com](http://www.gel.com)

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

SHIP DATE: 11JUL13  
ACTWGT: 65.0 LB MAN  
CAD: 0014176/CAFE2511

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: MR0A002068B0

3c



FedEx  
Express



J11131106060125

2 of 2  
MPS# 5462 9833 1545  
0263  
Mstr# 5462 9833 1534

FRI - 12 JUL 10:30A  
PRIORITY OVERNIGHT

0201

XX CHSA

29407  
SC-US CHS



Post 8 1561 434 R112 0810

NPS

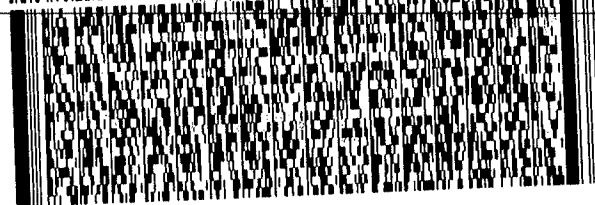
ORIGIN ID: SAFA (505) 666-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 11 JUL 13  
ACTWGT: 54.0 LB MAN  
CAD: 0014176/CAFE2511  
BILL SENDER

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

**CHARLESTON SC 29407**  
(843) 556-8171  
REF: MR0A00EC5Y00

4c



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J1113118650125

2 of 2  
MPS# 5462 9833 1567  
0263  
Mstr# 5462 9833 1556

**FRI - 12 JUL 10:30A**  
**PRIORITY OVERNIGHT**

0201

**XX CHSA**

**29407**  
**SC-US CHS**

Part 5 158145-434 RIT2 08710





ORIGIN ID: SAFA (605) 666-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 11JUL13  
ACTWGT: 60.0 LB MAN  
CAD: 0014176/CAFE2511

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: MR3A02244M00

4c

580C1/0884/188C



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J113116-868125

TRK#  
0201 5462 9833 1578

FRI - 12 JUL 10:30A  
PRIORITY OVERNIGHT

XX CHSA

29407

SC-US CHS



Part # 156148-434 FIT2 08/10

ORIGIN ID: SAFA (508) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

SHIP DATE: 11JUL13  
ACTWGT: 50.0 LB MAN  
CAD: 0014176/CAFE2511

LOS ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

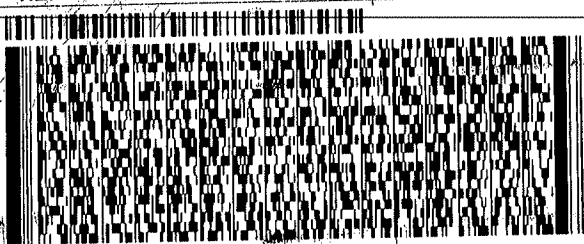
TO: VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: MR1A015AGWKO

5c

580CL/AR84/18BC



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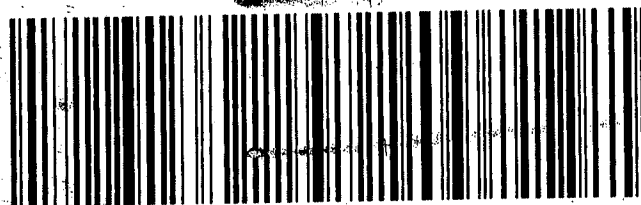
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XX CHSA

29407  
SC-US CHS

Part 3 155148-434 HIT2 0870



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

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 11JUL13  
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CAD: 0014176/CAFE2511

BILL SENDER

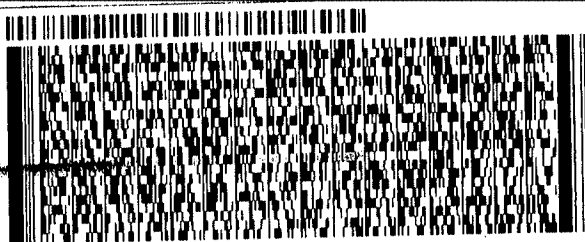
TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: MR0A002068B0

5c

580C1/AA04/1BBC



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1 of 2

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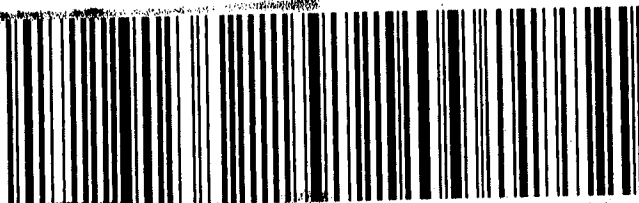
HH MASTER HH

XX CHSA

FRI - 12 JUL 10:30A  
PRIORITY OVERNIGHT

29407  
SC-US CHS

Part 3 156148-434 RITZ 2010



ORIGIN ID: SAFA (506) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

SHIP DATE: 11JUL13  
ACT WT: 42.0 LB MAN  
CAD: 0014178/CAFE2511

LOS ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

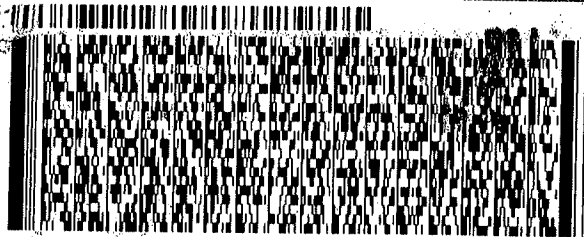
TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: MR0A00EC5Y00

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1 of 2

TRK#  
0201

5462 9833 1556

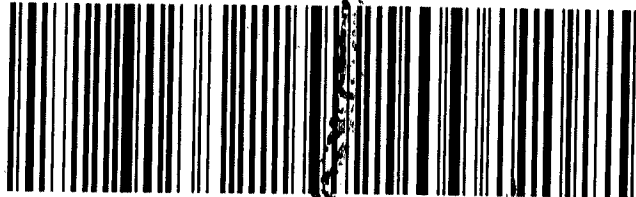
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FRI - 12 JUL 10:30A  
PRIORITY OVERNIGHT

XX CHSA

29407  
SC-US CHS

Part 8 166148-434 RIT2 08/10



ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: \*11JUL  
ACTWGT: 34.0 LB  
CAD: 0014176/CA 11

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: WE991158W100



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FRI - 12 JUL 10:30A  
PRIORITY OVERNIGHT

TRK# 5462 9833 1512  
0201

XX CHSA

29407  
SC-US CHS

Post 156148-434 5172 0910





# **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 2013-1101**

**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: 1315482

Prep Batch Number: 1315481

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202910330	Interference Check Sample (ICS)
1202910326	Method Blank (MB)
1202910327	Laboratory Control Sample (LCS)
1202910328	329247002(CAMO-13-36980) Matrix Spike (MS)
1202910329	329247002(CAMO-13-36980) 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**

All associated initial calibration verification standards (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 329247002 (CAMO-13-36980) from SDG 2013-1092 was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

Outliers were observed in 1202910328(MS) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MS can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

**Matrix Spike Duplicate (MSD) Recovery Statement**

Outliers were observed in 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MSD can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. 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 1202910328 (MS) and 1202910329 (MSD) 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 1203735 was generated for this SDG.

Outliers were observed in 1202910328(MS) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MS can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

Outliers were observed in 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MSD can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. 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: 2013-1101 GEL Work Order: 329377

#### 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: 26 JUL 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-36984Date Received: 12-JUL-13GEL Job No (SDG): 2013-1101GEL Sample ID: 329377002Date Filtered: 17-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	0.311	ug/L		1	17-JUL-13 18:28	per0717030a
	Perchlorate Isotope Ratio			3.11			1	17-JUL-13 18:28	per0717030a
14797-73-0	Perchlorate-101	.05	.2	0.294	ug/L		1	17-JUL-13 18:28	per0717030a
	Perchlorate-O(18)			0.495	ug/L		1	17-JUL-13 18:28	per0717030a

^ 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):** 2013-1101

**Extract Batch Code:** 1315481

**Date Filtered:** 17-JUL-13

**Matrix:** WATER

**Sample ID:** 1202910327

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.194	ug/L	96.9		85 - 115
Perchlorate Isotope Ratio		3.06				-
Perchlorate-101	0.200	.186	ug/L	93.1		85 - 115
Perchlorate-O(18)		.479	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):** 2013-1101

**Extract Batch Code:** 1315481

**Date Extracted:** 17-JUL-13

**GEL MS/PS ID:** 1202910328

**Client ID:** CAMO-13-36980

**GEL MSD/PSD ID:** 1202910329

**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	60.8	ug/L	57.2	-1780 *	63.4	1280 *	10.1	30	75 - 125
Perchlorate Isotope Ratio	0	3.12		3.08		3.13		1.54		-
Perchlorate-101	0.200	61.8	ug/L	59.0	-1440 *	64.3	1220 *	8.6	30	75 - 125
Perchlorate-O(18)	0	49.0	ug/L	48.5		51.9		6.82		-

^ 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: WATERExtraction Batch ID: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 17-JUL-13GEL Job No (SDG): 2013-1101GEL Sample ID: 1202910326Date Filtered: 17-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	17-JUL-13 17:29	per0717022a
	Perchlorate Isotope Ratio						1	17-JUL-13 17:29	per0717022a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	17-JUL-13 17:29	per0717022a
	Perchlorate-O(18)			0.532	ug/L		1	17-JUL-13 17:29	per0717022a

^ 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: WATERExtraction Batch ID: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 17-JUL-13GEL Job No (SDG): 2013-1101GEL Sample ID: 1202910327Date Filtered: 17-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	17-JUL-13 17:36	per0717023a
	Perchlorate Isotope Ratio			3.06			1	17-JUL-13 17:36	per0717023a
14797-73-0	Perchlorate-101	.05	.2	0.186	ug/L	J	1	17-JUL-13 17:36	per0717023a
	Perchlorate-O(18)			0.479	ug/L		1	17-JUL-13 17:36	per0717023a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-1101GEL Sample ID: 1202910330Date Filtered: 17-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	0.197	ug/L	J	1	17-JUL-13 17:44	per0717024a
	Perchlorate Isotope Ratio			2.94			1	17-JUL-13 17:44	per0717024a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	17-JUL-13 17:44	per0717024a
	Perchlorate-O(18)			0.558	ug/L		1	17-JUL-13 17:44	per0717024a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-36980MSDate Received: 11-JUL-13GEL Job No (SDG): 2013-1101GEL Sample ID: 1202910328Date Filtered: 17-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	5	20	57.2	ug/L		100	18-JUL-13 15:23	per0718015a
	Perchlorate Isotope Ratio			3.08			100	18-JUL-13 15:23	per0718015a
14797-73-0	Perchlorate-101	5	20	59.0	ug/L		100	18-JUL-13 15:23	per0718015a
	Perchlorate-O(18)			48.5	ug/L		100	18-JUL-13 15:23	per0718015a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-36980MSDDate Received: 11-JUL-13GEL Job No (SDG): 2013-1101GEL Sample ID: 1202910329Date Filtered: 17-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	5	20	63.4	ug/L		100	18-JUL-13 15:30	per0718016a
	Perchlorate Isotope Ratio			3.13			100	18-JUL-13 15:30	per0718016a
14797-73-0	Perchlorate-101	5	20	64.3	ug/L		100	18-JUL-13 15:30	per0718016a
	Perchlorate-O(18)			51.9	ug/L		100	18-JUL-13 15:30	per0718016a

^ 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			
<b>Mo.Day Yr.</b> 18-JUL-13	<b>Division:</b> Federal	<b>Quality Criteria:</b> Others	<b>Type:</b> Process
<b>Instrument Type:</b> LC-MS/MS	<b>Test / Method:</b> SW846 6850 Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ARSL001
<b>Batch ID:</b> 1315482	<b>Sample Numbers:</b> See below		
<b>Potentially affected work order(s)(SDG):</b> 329247(2013-1092),329250(2013-1091),329376(2013-1100),329377(2013-1101),329378(2013-1103),329545(2013-1128),329546(2013-1129) <b>Application Issues:</b> Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Outliers were observed for both 1202910328(MS) and 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%.		1. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329247002, and the need to dilute all at 1:100 prior to analysis. 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.	

**Originator's Name:**

Charles Wilson

18-JUL-13

**Data Validator/Group Leader:**

Michael Penny

22-JUL-13

# **Metals Analysis**

# Case Narrative

**Metals Fractional Narrative  
ARS International (ARSL)  
SDG 2013-1101**

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202909594	Method Blank (MB) <b>ICP</b>
1202909595	Laboratory Control Sample (LCS)
1202909598	329377002(CAMO-13-36984L) Serial Dilution (SD)
1202909596	329377002(CAMO-13-36984D) Sample Duplicate (DUP)
1202909597	329377002(CAMO-13-36984S) Matrix Spike (MS)
1202909589	Method Blank (MB) <b>ICP-MS</b>
1202909590	Laboratory Control Sample (LCS)
1202909593	329377002(CAMO-13-36984L) Serial Dilution (SD)
1202909591	329377002(CAMO-13-36984D) Sample Duplicate (DUP)
1202909592	329377002(CAMO-13-36984S) Matrix Spike (MS)
1202916997	Method Blank (MB) <b>CVAA</b>
1202916998	Laboratory Control Sample (LCS)
1202917001	329377002(CAMO-13-36984L) Serial Dilution (SD)
1202916999	329377002(CAMO-13-36984D) Sample Duplicate (DUP)
1202917000	329377002(CAMO-13-36984S) Matrix Spike (MS)

**Method/Analysis Information**

<b>Analytical Batch:</b>	1315157, 1315155, 1318196 and 1320801
<b>Prep Batch :</b>	1315156, 1315154 and 1318193
<b>Standard Operating Procedures:</b>	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
<b>Analytical Method:</b>	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
<b>Prep Method :</b>	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 CaCO<sub>3</sub> 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 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 standard(s) met the referenced advisory control limits.

#### **ICSA/ICSAB Statement**

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

#### **Continuing Calibration 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 sample was selected as the quality control (QC) sample for this SDG: 329377002 (CAMO-13-36984).

#### **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 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 RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

#### **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 329377002 required a dilution for tin in order to minimize suppression due to matrix interferences.

**Preparation Information**

The samples in this SDG were prepared exactly according to the cited SOP.

**Miscellaneous Information****Electronic Packaging Comment**

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

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

**Data Exception (DER) Documentation**

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.

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: 08/07/13



# **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: 2013-1101 GEL Work Order: 329377

**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



08/07/13

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2013-1101**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 329377002**BASIS:** As Received**DATE COLLECTED** 10-JUL-13**CLIENT ID:** CAMO-13-36984**LEVEL:** Low**DATE RECEIVED** 12-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	07/30/13 11:08	073013W1-6	1318196

**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

SDG No: 2013-1101

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 329377002

BASIS: As Received

DATE COLLECTED 10-JUL-13

CLIENT ID: CAMO-13-36984

LEVEL: Low

DATE RECEIVED 12-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	08/07/13 08:46	080713-1	1315157
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-39-3	Barium	25.8	ug/L		1	5	5	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-42-8	Boron	16.4	ug/L	J	15	50	50	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-70-2	Calcium	12000	ug/L		50	200	200	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-47-3	Chromium	2.81	ug/L	J	2	10	10	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/07/13 08:46	080713-1	1315157
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	08/07/13 08:46	080713-1	1315157
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7439-95-4	Magnesium	4190	ug/L		110	300	300	1	P	HSC	08/07/13 08:46	080713-1	1315157
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	08/07/13 08:46	080713-1	1315157
7439-98-7	Molybdenum	1.17	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/04/13 11:13	130804-3	1315155
7440-02-0	Nickel	1.69	ug/L	J	0.5	2	2	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-09-7	Potassium	1370	ug/L		50	150	150	1	P	HSC	08/07/13 08:46	080713-1	1315157
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7631-86-9	Silica	80300	ug/L		53	213	213	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-23-5	Sodium	10900	ug/L		100	300	300	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-24-6	Strontium	52.8	ug/L		1	5	5	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	08/04/13 07:10	130803-2	1315155
7440-31-5	Tin	50	ug/L	U	12.5	50	50	5	P	HSC	08/07/13 09:50	080713-1	1315157
7440-61-1	Uranium	0.597	ug/L		0.067	0.2	0.2	1	MS	BAJ	08/04/13 15:35	130804-5	1315155
7440-62-2	Vanadium	7.69	ug/L		1	5	5	1	P	HSC	08/07/13 08:46	080713-1	1315157
7440-66-6	Zinc	6.41	ug/L	J	3.3	10	10	1	P	HSC	08/07/13 08:46	080713-1	1315157

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**METALS**  
**-1-**  
**INORGANICS ANALYSIS DATA PACKAGE**

**SDG No:** 2013-1101**CONTRACT:** ESHL00210**METHOD TYPE:**

---

**SAMPLE ID:** 329377002      **BASIS:** As Received      **DATE COLLECTED** 10-JUL-13  
**CLIENT ID:** CAMO-13-36984      **LEVEL:** Low      **DATE RECEIVED** 12-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	47.3	mg/L		0.453	1.24	1.24	1		JJ2	08/07/13 11:27		1320801

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1315155	1315154	SW846 3005A	50	mL	50	mL	08/02/13	BCD1
1315157	1315156	SW846 3005A	50	mL	50	mL	08/03/13	BCD1
1318196	1318193	EPA 245.1/245.2 Prep	20	mL	20	mL	07/29/13	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. 2013-1101

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>
1202909589	Antimony	1	ug/L	+/-3	U	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	0.177	ug/L	+/-0.5	J	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
1202909594	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	50	ug/L	+/-150	U	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	3.64	ug/L	+/-10	J	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1202916997	Mercury	-0.113	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. 2013-1101 Client ID CAMO-13-36984S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 329377002 Spike ID: 1202909592

<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	53.5		1	U	50	107		MS
Arsenic	ug/L	75-125	50		1.7	U	50	99.4		MS
Cadmium	ug/L	75-125	52.3		0.11	U	50	105		MS
Chromium	ug/L	75-125	52.5		2.81	J	50	99.4		MS
Lead	ug/L	75-125	52.6		0.5	U	50	105		MS
Molybdenum	ug/L	75-125	54.3		1.17		50	106		MS
Nickel	ug/L	75-125	53.1		1.69	J	50	103		MS
Selenium	ug/L	75-125	51.9		1.5	U	50	103		MS
Silver	ug/L	75-125	53.2		0.2	U	50	106		MS
Thallium	ug/L	75-125	49.3		0.45	U	50	98.6		MS
Uranium	ug/L	75-125	57.8		0.597		50	114		MS

## \*Analytical Methods:

MS SW846 3005/6020 DOE-AL



## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2013-1101 Client ID CAMO-13-36984S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 329377002 Spike ID: 1202909597

<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>
Barium	ug/L	75-125	537		25.8		500	102		P
Beryllium	ug/L	75-125	521		1	U	500	104		P
Boron	ug/L	75-125	521		16.4	J	500	101		P
Calcium	ug/L	75-125	16900		12000		5000	96.7		P
Cobalt	ug/L	75-125	506		1	U	500	101		P
Copper	ug/L	75-125	539		3	U	500	108		P
Iron	ug/L	75-125	5190		30	U	5000	104		P
Magnesium	ug/L	75-125	9430		4190		5000	105		P
Manganese	ug/L	75-125	515		2	U	500	103		P
Potassium	ug/L	75-125	6320		1370		5000	99		P
Silica	ug/L		90800		80300		10700	97.7	N/A	P
Sodium	ug/L	75-125	15700		10900		5000	96.9		P
Strontium	ug/L	75-125	550		52.8		500	99.4		P
Tin	ug/L	75-125	544		12.5	U	500	109		P
Vanadium	ug/L	75-125	529		7.69		500	104		P
Zinc	ug/L	75-125	520		6.41	J	500	103		P
Aluminum	ug/L	75-125	4850		68	U	5000	96.9		P

## \*Analytical Methods:

P SW846 3005/6010B

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2013-1101 **Client ID:** CAMO-13-36984S**Contract:** ESHL00210 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 329377002 **Spike ID:** 1202917000

<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	2.03		0.067	U	2	101		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

**Metals**  
**–6–**  
**Duplicate Sample Summary**

SDG No.: 2013–1101

Lab Code: GEL

Contract: ESHL00210

Client ID: CAMO–13–36984D

Matrix: LIQUID

Level: Low

Sample ID: 329377002

Duplicate ID: 1202909591

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	+/-10	2.81 J		2.89 J		2.88		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.17		1.16		.343		MS
Nickel	ug/L	+/-2	1.69 J		1.71 J		1.41		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	0.597		0.595		.336		MS

\*Analytical Methods:

MS SW846 3005/6020 DOE-AL

**Metals**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2013-1101

Lab Code: GEL

Contract: ESHL00210

Client ID: CAMO-13-36984D

Matrix: LIQUID

Level: Low

Sample ID: 329377002

Duplicate ID: 1202909596

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	+/-20%	25.8		25.8		.151		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	16.4 J		15.2 J		7.42		P
Calcium	ug/L	+/-20%	12000		12000		.167		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%	4190		4130		1.58		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1370		1370		.343		P
Silica	ug/L	+/-20%	80300		80100		.281		P
Sodium	ug/L	+/-20%	10900		10700		1.91		P
Strontium	ug/L	+/-20%	52.8		51.9		1.6		P
Tin	ug/L		12.5 U		12.5 U				P
Vanadium	ug/L	+/-5	7.69		7.36		4.37		P
Zinc	ug/L	+/-10	6.41 J		6.13 J		4.53		P

\*Analytical Methods:

P SW846 3005/6010B

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2013–1101**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAMO–13–36984D**Matrix:** LIQUID**Level:** Low**Sample ID:** 329377002**Duplicate ID:** 1202916999**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Mercury	ug/L		0.067	U	0.067	U			AV

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**\*Analytical Methods:**

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2013-1101

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>
1202909590								
	Antimony	ug/L	50	52.2		104	80-120	MS
	Arsenic	ug/L	50	49.3		98.6	80-120	MS
	Cadmium	ug/L	50	53		106	80-120	MS
	Chromium	ug/L	50	50.3		101	80-120	MS
	Lead	ug/L	50	51.5		103	80-120	MS
	Molybdenum	ug/L	50	53		106	80-120	MS
	Nickel	ug/L	50	55.5		111	80-120	MS
	Selenium	ug/L	50	53.3		107	80-120	MS
	Silver	ug/L	50	55.1		110	80-120	MS
	Thallium	ug/L	50	48.9		97.7	80-120	MS
	Uranium	ug/L	50	55.1		110	80-120	MS

## \*Analytical Methods:

MS SW846 3005/6020 DOE-AL

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2013-1101

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>
1202909595								
	Aluminum	ug/L	5000	4950		99	80-120	P
	Barium	ug/L	500	521		104	80-120	P
	Beryllium	ug/L	500	522		104	80-120	P
	Boron	ug/L	500	507		101	80-120	P
	Calcium	ug/L	5000	5390		108	80-120	P
	Cobalt	ug/L	500	516		103	80-120	P
	Copper	ug/L	500	527		105	80-120	P
	Iron	ug/L	5000	5240		105	80-120	P
	Magnesium	ug/L	5000	5480		110	80-120	P
	Manganese	ug/L	500	526		105	80-120	P
	Potassium	ug/L	5000	5060		101	80-120	P
	Silica	ug/L	10700	10800		101	80-120	P
	Sodium	ug/L	5000	4900		97.9	80-120	P
	Strontium	ug/L	500	504		101	80-120	P
	Tin	ug/L	500	543		109	80-120	P
	Vanadium	ug/L	500	527		105	80-120	P
	Zinc	ug/L	500	522		104	80-120	P

## \*Analytical Methods:

P SW846 3005/6010B

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2013-1101

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>
1202916998	Mercury	ug/L	2	2.05		102	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2



## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2013-1101

Client ID: CAMO-13-36984L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 329377002

Serial Dilution ID: 1202909593

<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	2.81	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.17		1.46	J	25			MS
Nickel	1.69	J	2.5	U	100			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.597		.66	J	10.6			MS

## \*Analytical Methods:

MS SW846 3005/6020 DOE-AL

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2013-1101

Client ID: CAMO-13-36984L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 329377002

Serial Dilution ID: 1202909598

<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	25.8		26.3		1.97			P
Beryllium	1	U	5	U				P
Boron	16.4	J	75	U	100			P
Calcium	12000		11700		2.73		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	4190		3900		6.99			P
Manganese	2	U	10	U				P
Potassium	1370		823		39.9			P
Silica	80300		79900		.487		10	P
Sodium	10900		10900		.404		10	P
Strontium	52.8		54.7		3.63		10	P
Tin	2.5	U	14.1	J				P
Vanadium	7.69		7.82	J	1.72			P
Zinc	6.41	J	16.5	U	100			P

## \*Analytical Methods:

P SW846 3005/6010B

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2013-1101 **Client ID:** CAMO-13-36984L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 329377002 **Serial Dilution ID:** 1202917001

<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

# **General Chem Analysis**

# Case Narrative

**General Chemistry Narrative  
ARS International (ARSL)  
SDG 2013-1101**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1317001

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377001	CAMO-13-36976
1202914124	Method Blank (MB)
1202914125	329377001(CAMO-13-36976) Sample Duplicate (DUP)
1202914126	329377001(CAMO-13-36976) Post Spike (PS)
1202914127	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: 329377001 (CAMO-13-36976).

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

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

##### **Duplicate Relative Percent Difference (RPD) Statement**

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

#### **Technical Information**

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

##### **Holding Times**

All samples in this SDG met the specified holding time.

##### **Sample Preservation/Integrity**

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

##### **Sample Dilutions**

The samples in this SDG did not require dilutions.

##### **Sample Re-analysis**

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

#### **Miscellaneous Information**

##### **Data Exception (DER) Documentation**

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

##### **Additional Comments**

A 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:** 1318512

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202917840	329376002(CAMO-13-37046) Sample Duplicate (DUP)
1202917841	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-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 sample was selected for QC analysis: 329376002 (CAMO-13-37046).

#### **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:** 1314715    **Method:** EPA 150.1 pH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202908480	329250002(CAMO-13-36983) Sample Duplicate (DUP)
1202908483	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 sample was selected for QC analysis: 329250002 (CAMO-13-36983).

**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 sample from this sample group was received by the lab outside of the method specified holding time: 329377002 (CAMO-13-36984).

**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: 1202489 329377002 (CAMO-13-36984).

**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:** 1314143

**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:

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202907193	Method Blank (MB)
1202907194	329247002(CAMO-13-36980) Sample Duplicate (DUP)
1202907195	329247002(CAMO-13-36980) Post Spike (PS)
1202907196	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: 329247002 (CAMO-13-36980).

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

The PS mixture contains seven anions of interest. Of those, all requested anions except chloride met normal acceptance criteria for recovery (90 - 110%). This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported. 1202907195 (CAMO-13-36980).

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The following samples in this sample group were diluted due to high concentration: 1202907194 (CAMO-13-36980) and 1202907195 (CAMO-13-36980).

**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. The following DER was generated for this SDG: DER# 1208296.

**Manual Integrations**

Manual integrations were not required for the samples in 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:** Ammonia Nitrogen

**Analytical Batch:** 1314770      **Method:** EPA 350.1 Nitrogen and Ammonia L

**Prep Batch :** 1314769      **Method:** EEPA 350.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202908626	Method Blank (MB)
1202908627	Laboratory Control Sample (LCS)
1202908628	329377002(CAMO-13-36984) Sample Duplicate (DUP)
1202908629	329377002(CAMO-13-36984) 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-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 sample was selected for QC analysis: 329377002 (CAMO-13-36984).

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

The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1202908629 (CAMO-13-36984).

**Duplicate Relative Percent Difference (RPD) Statement**

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

The following DER was generated for this SDG: 1203603 1202908629 (CAMO-13-36984).

**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**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1315708	<b>Method:</b>	Nitrogen and Total Kjeldahl (TKN)
<b>Prep Batch :</b>	1315707	<b>Method:</b>	EEPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377001	CAMO-13-36976
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**

<b>Product:</b>	<b>Nitrate Nitrite by Cadmium Reduction</b>		
<b>Analytical Batch:</b>	1314793	<b>Method:</b>	EPA 353.2 Nitrogen and Nitrate/Nitrite

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202908678	Method Blank (MB)
1202908680	329250002(CAMO-13-36983) Sample Duplicate (DUP)
1202908684	329250002(CAMO-13-36983) Post Spike (PS)
1202908687	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: 329250002 (CAMO-13-36983).

**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 following samples in this sample group were diluted due to high concentration: 1202908680 (CAMO-13-36983) and 1202908684 (CAMO-13-36983). The following sample in this sample group was diluted due to matrix interference: 329377002 (CAMO-13-36984).

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1313807	<b>Method:</b>	EPA 365.4 Phosphorus and Total in
<b>Prep Batch :</b>	1313806	<b>Method:</b>	EEPA 365.4 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202906421	Method Blank (MB)
1202906422	Laboratory Control Sample (LCS)
1202906423	329247002(CAMO-13-36980) Sample Duplicate (DUP)
1202906424	329247002(CAMO-13-36980) Matrix Spike (MS)
1202910151	329384001(NP048-13-38787) Sample Duplicate (DUP)
1202910152	329384001(NP048-13-38787) 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: 329247002 (CAMO-13-36980) and 329384001 (NP048-13-38787).

**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 sample was re-analyzed due to instrument failure: 1202906421 (MB).

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:

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

### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1314710

**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:

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202908469	Method Blank (MB)
1202908470	329376002(CAMO-13-37046) Sample Duplicate (DUP)
1202908472	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: 329376002 (CAMO-13-37046).

**Duplicate Relative Percent Difference (RPD) Statement**

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1202908470 (CAMO-13-37046).

**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**

The following DER was generated for this SDG: 1202806 1202908470 (CAMO-13-37046).

**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:** 1316484      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
329377002	CAMO-13-36984
1202912831	329250002(CAMO-13-36983) Sample Duplicate (DUP)
1202912833	329250002(CAMO-13-36983) Matrix Spike (MS)
1202912834	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: 329250002 (CAMO-13-36983).

#### **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 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**

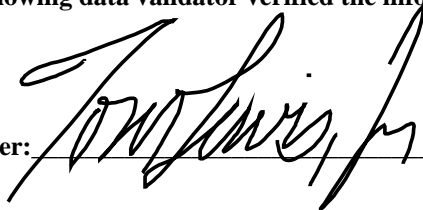
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**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:

08Aug13



# **Sample Data Summary**

## GEL LABORATORIES LLC

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### Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1101 GEL Work Order: 329377

**The Qualifiers in this report are defined as follows:**

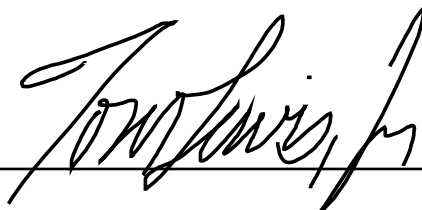
- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a Tracer compound
- \*\* Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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

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## Certificate of Analysis

Report Date: August 7, 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: 2013-1101

Client Sample ID: CAMO-13-36976  
Sample ID: 329377001  
Matrix: W  
Collect Date: 10-JUL-13 13:10  
Receive Date: 12-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	0.431	0.330	1.00	mg/L	1	TSM	07/25/13	1242	1317001	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	08/06/13	1444	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:

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## Certificate of Analysis

Report Date: August 7, 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: 2013-1101

Client Sample ID: CAMO-13-36984  
Sample ID: 329377002  
Matrix: W  
Collect Date: 10-JUL-13 13:10  
Receive Date: 12-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		134	1.00	1.00	umhos/cm	1	LXA1	07/30/13	1504	1318512	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 13.9C	H	8.10	0.010	0.100	SU	1	LYG1	07/15/13	0846	1314715	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MAR1	08/03/13	1149	1314143	3
Chloride		2.10	0.067	0.200	mg/L	1					
Fluoride		0.570	0.033	0.100	mg/L	1					
Sulfate		2.48	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia	J	0.0318	0.017	0.050	mg/L	1	KLP1	07/18/13	1347	1314770	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		0.444	0.085	0.250	mg/L	5	KLP1	07/29/13	1401	1314793	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		0.121	0.017	0.050	mg/L	1	KLP1	07/16/13	1519	1313807	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		137	3.40	14.3	mg/L		LYG1	07/15/13	0959	1314710	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		62.4	0.725	1.00	mg/L		LXA1	07/22/13	1514	1316484	8
Carbonate alkalinity (CaCO3)	U	ND	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	07/18/13	1240	1314769
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	07/15/13	1700	1313806

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: August 7, 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: 2013-1101

Client Sample ID: CAMO-13-36984  
Sample ID: 329377002

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

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## QC Summary

Report Date: August 7, 2013

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 329377

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1317001										
QC1202914125	329377001	DUP									
Total Organic Carbon Average	J	0.431	J	0.368	mg/L	15.8	^	(+/-1.00)	TSM	07/25/13	13:16
QC1202914127	LCS										
Total Organic Carbon Average	10.0			9.63	mg/L			(85%-115%)		07/25/13	12:33
QC1202914124	MB										
Total Organic Carbon Average			U	ND	mg/L					07/25/13	12:24
QC1202914126	329377001	PS									
Total Organic Carbon Average	10.0	J	0.431	10.5	mg/L			(65%-120%)		07/25/13	13:35
<b>Conductivity Analysis</b>											
Batch	1318512										
QC1202917840	329376002	DUP									
Conductivity		142		141	umhos/cm	0.282		(0%-10%)	LXA1	07/30/13	15:04
QC1202917841	LCS										
Conductivity	1410			1420	umhos/cm			(95%-105%)		07/30/13	14:57
<b>Electrode Analysis</b>											
Batch	1314715										
QC1202908480	329250002	DUP									
pH	H	8.02	H	8.02	SU	0.00		(0%-10%)	LYG1	07/15/13	08:31
QC1202908483	LCS										
pH	7.00			7.00	SU			(99%-101%)		07/15/13	08:16
<b>Ion Chromatography</b>											
Batch	1314143										
QC1202907194	329247002	DUP									
Bromide		0.621		0.681	mg/L	9.34	^	(+/-0.200)	MAR1	07/25/13	16:48
Chloride		61.7		61.9	mg/L	0.389		(0%-20%)		07/25/13	18:17
Fluoride		0.626		0.631	mg/L	0.764		(0%-20%)		07/25/13	16:48
Sulfate		66.8		67.4	mg/L	0.814		(0%-20%)		07/25/13	18:17
QC1202907196	LCS										
Bromide	1.25			1.24	mg/L			(90%-110%)		07/25/13	15:48

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## QC Summary

Workorder: 329377

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1314143										
Chloride	5.00			4.63	mg/L		92.7	(90%-110%)	MAR1	07/25/13	15:48
Fluoride	2.50			2.46	mg/L		98.2	(90%-110%)			
Sulfate	10.0			9.75	mg/L		97.5	(90%-110%)			
QC1202907193 MB											
Bromide			U	ND	mg/L					07/25/13	15:18
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202907195 329247002 PS											
Bromide	1.25	0.621		1.84	mg/L		97.5	(90%-110%)		07/25/13	17:17
Chloride	5.00	6.17		11.8	mg/L		113 *	(90%-110%)		07/25/13	18:47
Fluoride	2.50	0.626		3.09	mg/L		98.7	(90%-110%)		07/25/13	17:17
Sulfate	10.0	6.68		17.3	mg/L		107	(90%-110%)		07/25/13	18:47
<b>Nutrient Analysis</b>											
Batch	1313807										
QC1202906423 329247002 DUP											
Phosphorus, Total as P		0.156		0.167	mg/L	6.81	^	(+/-0.050)	KLP1	07/16/13	15:08
QC1202910151 329384001 DUP											
Phosphorus, Total as P		0.166		0.167	mg/L	0.601	^	(+/-0.050)		07/16/13	15:22
QC1202906422 LCS											
Phosphorus, Total as P	1.00			1.13	mg/L		113	(76%-120%)		07/16/13	15:03
QC1202906421 MB											
Phosphorus, Total as P		U		ND	mg/L					07/16/13	15:12
QC1202906424 329247002 MS											
Phosphorus, Total as P	1.00	0.156		1.09	mg/L		93.4	(62%-139%)		07/16/13	15:09
QC1202910152 329384001 MS											
Phosphorus, Total as P	1.00	0.166		1.08	mg/L		91.4	(62%-139%)		07/16/13	15:23



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## QC Summary

Workorder: 329377

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1314770										
QC1202908628	329377002	DUP									
Nitrogen, Ammonia	J	0.0318	J	0.0358	mg/L	11.8	^	(+/-0.050)	KLP1	07/18/13	13:48
QC1202908627	LCS										
Nitrogen, Ammonia	1.00			0.995	mg/L			99.5 (90%-110%)		07/18/13	13:21
QC1202908626	MB										
Nitrogen, Ammonia			J	0.0337	mg/L					07/18/13	13:21
QC1202908629	329377002	MS									
Nitrogen, Ammonia	1.00	J	0.0318	0.903	mg/L			87.1 * (90%-110%)		07/18/13	13:49
Batch	1314793										
QC1202908680	329250002	DUP									
Nitrogen, Nitrate/Nitrite		1.65		1.48	mg/L	10.9		(0%-20%)	KLP1	07/29/13	13:58
QC1202908687	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.961	mg/L			96.1 (90%-110%)		07/29/13	13:32
QC1202908678	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					07/29/13	13:31
QC1202908684	329250002	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.329	1.35	mg/L			102 (90%-110%)		07/29/13	13:59
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									
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%)		08/06/13	14:46
<b>Solids Analysis</b>											
Batch	1314710										
QC1202908470	329376002	DUP									
129											

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## QC Summary

Workorder: 329377

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Solids Analysis</b>											
Batch	1314710										
Total Dissolved Solids		204			mg/L	45.5*		(0%-10%)	LYG1	07/15/13	09:59
QC1202908472 LCS											
Total Dissolved Solids	300			293	mg/L		97.6	(95%-105%)		07/15/13	09:59
QC1202908469 MB											
Total Dissolved Solids			U	ND	mg/L					07/15/13	09:59
<b>Titration Analysis</b>											
Batch	1316484										
QC1202912831 329250002 DUP											
Alkalinity, Total as CaCO3		60.8		60.8	mg/L	0.00		(0%-20%)	LXA1	07/22/13	14:56
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202912834 LCS											
Alkalinity, Total as CaCO3	50.0			51.5	mg/L		103	(90%-110%)		07/22/13	14:40
QC1202912833 329250002 MS											
Alkalinity, Total as CaCO3	50.0	60.8		112	mg/L		102	(80%-120%)		07/22/13	15:04

### 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
- 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.

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 329377

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

<b>Mo.Day Yr.</b> 15-JUL-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SM 4500-H B, SW846 9040B/9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BETT, ESHL, NORH, SNLS,
<b>Batch ID:</b> 1314715	<b>Sample Numbers:</b> See below.		
<b>Potentially affected work order(s)(SDG):</b> 329142(2013-1086),329174,329247(2013-1092),329250(2013-1091),329367,329370,329376(2013-1100),329377(2013-1101),329379(2013-1104),329381,329382(2013-1105) <b>Application Issues:</b> Sample received out of holding			
<b>Specification and Requirements</b> <b>Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample received out of holding: 329142 002,003 329174 002,006,010 329247 002 329250 002 329367 001,002,003 329370 004 329376 002 329377 002 329379 008,016 329381 002,007,011,016 329382 001		1. Samples were received out of holding.	

**Originator's Name:**

Lisa Gregory 15-JUL-13

**Data Validator/Group Leader:**

Julia Hamilton 15-JUL-13

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 16-JUL-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE	<b>Test / Method:</b> EPA 160.1, SM 2540C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, OLAB, UCOR, VERA,
<b>Batch ID:</b> 1314710	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 329360,329376(2013-1100),329377(2013-1101),329381,329385(2013-1108),329401,329507(X307070)</b> <b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>  1. Failed RPD for DUP: QC   1202908470DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample.	

**Originator's Name:**  
Lisa Gregory           16-JUL-13

**Data Validator/Group Leader:**  
Thomas Lewis           19-JUL-13

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 18-JUL-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 350.1, EPA 350.1 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ALBR, ALMX, CHSE, ECWS,
<b>Batch ID:</b> 1314770	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 329235,329247(2013-1092),329250(2013-1091),329264,329312,329314,329346,329352,329360,329369,329376(2013-1100),329377(2013-1101) <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed Recovery for MS/PS:  QC 1202908629MS		1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.	

**Originator's Name:**  
Kristen Parson 18-JUL-13

**Data Validator/Group Leader:**  
Thomas Lewis 18-JUL-13

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 05-AUG-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> IC	<b>Test / Method:</b> EPA 300.0	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1314143	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 329247(2013-1092),329250(2013-1091),329376(2013-1100),329377(2013-1101) <b>Application Issues:</b> Failed Recovery for MS/PS			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed Recovery for MS/PS: QC 1202907195PS		The PS mixture contains seven anions of interest. Of those, all requested anions except chloride met normal acceptance criteria for recovery (90 - 110%). This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported.	

**Originator's Name:**  
Dustin Miller 05-AUG-13

**Data Validator/Group Leader:**  
Thomas Lewis 07-AUG-13



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 06-AUG-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 351.2	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1315708	<b>Sample Numbers:</b> See below.		
<p><b>Potentially affected work order(s)(SDG):</b> 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><b>Application Issues:</b></p> <p>Failed Recovery for MS/PS</p>			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<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