

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling SANDIA

SAMPLE ID: CASA-13-36991 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/23/2013	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1122	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	RSP
LOCATION ID: SCI-2		↓	FIELD PREP:	UF	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE:	REG	↓
PORT: SINGLE COMPLETION		↓	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:

NA

FIELD PARAMETERS:

Dissolved Oxygen 8.26 mg/L Oxidation-Reduction Potential 180.2 MV pH 7.39 SU

Specific Conductance 608 uS/cm Temperature 16.05 deg C Turbidity 0.2 NTU

COLLECTED BY (PRINT) W. Shaw

RELINQUISHED BY (Printed Name) David Fellenz (Signature) <i>[Signature]</i>	Date/Time 7/23/13 1205	RECEIVED BY (Printed Name) M. Martin (Signature) <i>[Signature]</i>	Date/Time 7/23/13 1205
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/23/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling_SANDIA

SAMPLE ID: CASA-13-36995 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		07/23/2013	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1122	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	RSP
LOCATION ID: SCI-2		↓	FIELD PREP:	F	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: SINGLE COMPLETION		↓	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:

NA

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) W. Shaw

RELINQUISHED BY (Printed Name) David Fellner (Signature) <i>[Signature]</i>	Date/Time 7/23/13 1205	RECEIVED BY (Printed Name) M. Martin (Signature) <i>[Signature]</i>	Date/Time 7/23/13 1205
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/23/2013

Data Validation Report

Chain Of Custody No. 2013-1309

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
	330187 EPA:120.1	1				
	330187 EPA:150.1	1				
	330187 EPA:160.1	1				
	330187 EPA:245.2	1				
	330187 EPA:300.0	1				
	330187 EPA:310.1	1				
	330187 EPA:350.1	1				
	330187 EPA:351.2	1				
	330187 EPA:353.2	1				
	330187 EPA:365.4	1				
	330187 SM:A2340B	1				
	330187 SW-846:6010B	1				
	330187 SW-846:6020	1				
	330187 SW-846:6850	1				
	330187 SW-846:9060	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups
	330187 EPA:120.1	1322097	1322097	1							
	330187 EPA:150.1	1318848	1318848	1							
	330187 EPA:160.1	1317422	1317422	1						1	
	330187 EPA:245.2	1321741	1321738	1						1	1
	330187 EPA:300.0	1317655	1317655	1						1	
	330187 EPA:310.1	1319311	1319311	1						2	1
	330187 EPA:350.1	1317191	1317190	1						1	1
	330187 EPA:351.2	1318220	1318219	1						1	2
	330187 EPA:353.2	1318202	1318202	1						1	
	330187 EPA:365.4	1317225	1317224	1						1	2
	330187 SM:A2340B	1324554	1324554	1							
	330187 SW-846:6010B	1323250	1323249	1						1	2
	330187 SW-846:6020	1323254	1323251	1						1	1
	330187 SW-846:6850	1318125	1318124	1						1	2
	330187 SW-846:9060	1318098	1318098	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-13-37044	1202926611	DUP		1	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG		1	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-13-37019	1202926610	DUP		1	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202926612	LCS		0	0	1
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36995	1202918638	DUP		1	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG		1	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202918640	LCS		0	0	1
EPA:160.1	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG		1	0	0
EPA:160.1	GENERAL CHEMISTRY	CASA-13-37021	1202915197	DUP		1	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202915198	LCS		0	0	1

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

EPA:160.1	GENERAL CHEMISTRY	MB	1202915196	MB	1	0	0	0
EPA:245.2	INORGANIC	CASA-13-36995	330187002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202925703	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202925702	MB	1	0	0	0
EPA:245.2	INORGANIC	WST40-13-39399	1202925704	DUP	1	0	0	0
EPA:245.2	INORGANIC	WST40-13-39399	1202925705	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-13-37062	1202915734	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202915736	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202915733	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36995	1202919730	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36995	1202919731	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202919729	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202920423	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202919728	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202920422	MB	2	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-13-36985	1202914647	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-13-36985	1202914648	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202914644	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202914643	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-37034	1202917062	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-37034	1202917063	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CASA-13-36991	1202921241	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CASA-13-36991	1202921242	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CASA-13-36991	330187001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202917061	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202917060	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-13-36995	1202917015	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202917018	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202917013	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36994	1202914750	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36994	1202914752	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36995	330187002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-37021	1202916979	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-37021	1202916980	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202914754	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202914749	MB	1	0	0	0
SM:A2340B	INORGANIC	CASA-13-36995	330187002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CALA-13-34116	1202929359	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CALA-13-34116	1202929360	MS	0	0	17	0
SW-846:6010B	INORGANIC	CASA-13-36995	330187002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202929355	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202929354	MB	17	0	0	0
SW-846:6010B	INORGANIC	RE43-13-38045	1202929356	DUP	17	0	0	0
SW-846:6010B	INORGANIC	RE43-13-38045	1202929357	MS	0	0	17	0
SW-846:6020	INORGANIC	CAMO-13-37044	1202929368	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-13-37044	1202929369	MS	0	0	11	0
SW-846:6020	INORGANIC	CASA-13-36995	330187002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202929367	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202929366	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CASA-13-36995	330187002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CASA-13-37019	1202916786	MS	0	0	1	0

SW-846:6850	LCMS/MS PERCHLORATE	CASA-13-37019	1202916787	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202916785	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202916784	MB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	WST16-13-36930	1202921071	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	WST16-13-36930	1202921072	MSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-13-37036	1202916715	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CASA-13-36991	330187001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202916719	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202916714	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	1202914643	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0331	J	mg/L	0.05
MB	1202929354	METHOD BLANK	SW-846:6010B	W	Copper	-9.79	J	ug/L	10

Any samples affected by the presence of contaminants in blanks?

Field	Blank Field	Blank Lab	Blank	Analytical	Parameter		Blank	Sample	Lab	Detect	
Sample ID	Sample ID	Sample ID	Type	Method	Name	Units	Result	Result	Qualifier	Limit	Detected
CASA-13-36995	MB	1202929354	METHOD BLANK	SW-846:6010B	Copper	ug/L	-9.79	50	U	50	N

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-13-37034	1202917063		EPA:351.2	Total Kjeldahl Nitrogen	1318219	8/20/2013	W	18		110	90
CALA-13-34116	1202929360		SW-846:6010B	Sodium	1323249	8/21/2013	W	68.3		125	75

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

Rejection
Limit
10
10

RPD

RPD
Limit

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.

No.

Reason Code Description

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

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

U_LAB The analytical laboratory qualified the analyte as not detected.

14. Useable Result Count.

Field	Location	Sample	Analytical	No. Unuseable	Total No. Of
Sample ID	ID	Purpose	Method	Records	Records
CASA-13-36991	SCI-2	REG	EPA:351.2	0	1
CASA-13-36991	SCI-2	REG	SW-846:9060	0	1
CASA-13-36995	SCI-2	REG	EPA:120.1	0	1
CASA-13-36995	SCI-2	REG	EPA:150.1	0	1
CASA-13-36995	SCI-2	REG	EPA:160.1	0	1
CASA-13-36995	SCI-2	REG	EPA:245.2	0	1
CASA-13-36995	SCI-2	REG	EPA:300.0	0	4
CASA-13-36995	SCI-2	REG	EPA:310.1	0	2
CASA-13-36995	SCI-2	REG	EPA:350.1	0	1
CASA-13-36995	SCI-2	REG	EPA:353.2	0	1
CASA-13-36995	SCI-2	REG	EPA:365.4	0	1
CASA-13-36995	SCI-2	REG	SM:A2340B	0	1
CASA-13-36995	SCI-2	REG	SW-846:6010B	0	17
CASA-13-36995	SCI-2	REG	SW-846:6020	0	11
CASA-13-36995	SCI-2	REG	SW-846:6850	0	1



August 21, 2013

www.gel.com

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

Re: LANL-WQH Water Samples
Work Order: 330187
SDG: 2013-1309

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on July 25, 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: 2013-1309
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 330187
SDG: 2013-1309

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 330187
SDG # : 2013-1309**

August 21, 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 25, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
330187001	CASA-13-36991
330187002	CASA-13-36995

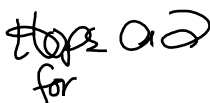
Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

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

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



Valerie Davis
Project Manager

List of current GEL Certifications as of 21 August 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Nevada	SC000122011-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation

[illegible]



SAMPLE RECEIPT & REVIEW FORM

Client: <u>LANL</u>		SDG/AR/COC/Work Order: <u>2013-1301</u>	
Received By: <u>P. Went</u>		Date Received: <u>7.25.13</u>	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0CPM</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe) <u>2,4,5c</u>
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>61524649</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe) <u>7.25.13</u>
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: <u>Please See Attached Sheet</u> <u>For Details</u>
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	<u>Clients</u>
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.	<input checked="" type="checkbox"/>			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5462 9833 2265-2c</u> <u>5462 9833 2276-4c</u> <u>5462 9833 2254-5c</u>

Comments (Use Continuation Form if needed):

Client: LANL Received By: P. A. Dent Date Received: 7-25-13 SDG/AR/COC/Work Order: 2013-1309

WTR0-13-38956 the Lab rec'd 9 containers for SW.SSC not listed on Chain of Custody. The Lab rec'd a 250 poly doubled Label for both RO-ph + RO ALK chain indicates 1 container for each. For Razz6/228 the Lab rec'd 1. Container chain indicates 4.

CAPA-13-36951 the Lab rec'd (1) 82606 Container instead of 2-95 indicated on chain.

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: 24JUL13
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

° VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: MR1A01407000

2c

580CL/R084/189C



FedEx
Express



J11131106060125

1 of 2
TRK# 5462 9833 2265
0201
HH MASTER HH

THU - 25 JUL 10:30A
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS

Part # 156148-434 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: 24 JUL 13
ACTWGT: 40.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: MR1A01407000



FedEx
Express



580C1/AR04/188C

J11131106060125

2 of 2
MPS# 5462 9833 2276
0263
Mstr# 5462 9833 2265

0201

XX CHSA

THU - 25 JUL 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS

Part # 155148-434 RIT2 08/10



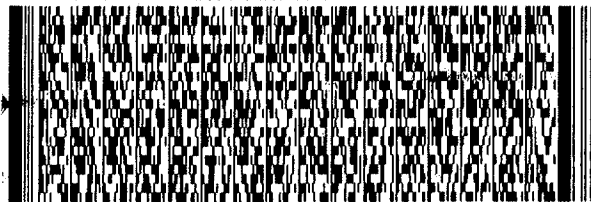
SHIP DATE: 24JUL13
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

58001/0004/1000

5c

REF: MR1A015AGWKO



FedEx
Express



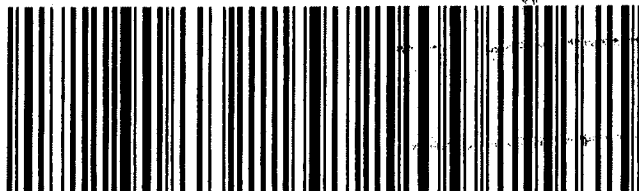
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SC-US CHS

Part # 156148-434 3IT2 08/10 36 36



ND

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 2013-1309**

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: 1318125

Prep Batch Number: 1318124

Sample Analysis

Sample ID	Client ID
330187002	CASA-13-36995
1202916788	Interference Check Sample (ICS)
1202916784	Method Blank (MB)
1202916785	Laboratory Control Sample (LCS)
1202916786	330090002(CASA-13-37019) Matrix Spike (MS)
1202916787	330090002(CASA-13-37019) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 10.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

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

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 330090002 (CASA-13-37019) from SDG 2013-1294 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries were within the established acceptance limits.

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

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

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

Manual Integrations

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 concentration observed in 1202916786 (CASA-13-37019MS) and 1202916787 (CASA-13-37019MSD) were just above the calibration range for both Perchlorate and Perchlorate-101. This was due to the background concentration present in the parent sample, 330090002 (CASA-13-37019). There was no need to re-analyze the matrix spikes at a dilution.

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: 2013-1309 GEL Work Order: 330187

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
- 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: 13 AUG 2013

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CASA-13-36995Date Received: 25-JUL-13GEL Job No (SDG): 2013-1309GEL Sample ID: 330187002Date Filtered: 03-AUG-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	0.961	ug/L		1	05-AUG-13 20:26	per0805034a
	Perchlorate Isotope Ratio			3.08			1	05-AUG-13 20:26	per0805034a
14797-73-0	Perchlorate-101	.05	.2	0.948	ug/L		1	05-AUG-13 20:26	per0805034a
	Perchlorate-O(18)			0.517	ug/L		1	05-AUG-13 20:26	per0805034a

^ 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): 2013-1309

Extract Batch Code: 1318124

Date Filtered: 03-AUG-13

Matrix: WATER

Sample ID: 1202916785

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.204	ug/L	102		85 - 115
Perchlorate Isotope Ratio		3.07				-
Perchlorate-101	0.200	.202	ug/L	101		85 - 115
Perchlorate-O(18)		.522	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): 2013-1309

Extract Batch Code: 1318124

Date Extracted: 03-AUG-13

GEL MS/PS ID: 1202916786

Client ID: CASA-13-37019

GEL MSD/PSD ID: 1202916787

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	0.838	ug/L	1.01	88.3	1.02	93.2	.975	30	75 - 125
Perchlorate Isotope Ratio	0	3.12		3.02		3.07		1.52		-
Perchlorate-101	0.200	0.818	ug/L	1.02	102	1.02	98.9	.544	30	75 - 125
Perchlorate-O(18)	0	0.530	ug/L	0.551		.541		1.85		-

^ 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: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 03-AUG-13GEL Job No (SDG): 2013-1309GEL Sample ID: 1202916784Date Filtered: 03-AUG-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	05-AUG-13 18:36	per0805021a
	Perchlorate Isotope Ratio						1	05-AUG-13 18:36	per0805021a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	05-AUG-13 18:36	per0805021a
	Perchlorate-O(18)			0.504	ug/L		1	05-AUG-13 18:36	per0805021a

^ 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: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 03-AUG-13GEL Job No (SDG): 2013-1309GEL Sample ID: 1202916785Date Filtered: 03-AUG-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	0.204	ug/L		1	05-AUG-13 18:44	per0805022a
	Perchlorate Isotope Ratio			3.07			1	05-AUG-13 18:44	per0805022a
14797-73-0	Perchlorate-101	.05	.2	0.202	ug/L		1	05-AUG-13 18:44	per0805022a
	Perchlorate-O(18)			0.522	ug/L		1	05-AUG-13 18:44	per0805022a

^ 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: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-1309GEL Sample ID: 1202916788Date Filtered: 03-AUG-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	0.201	ug/L		1	05-AUG-13 18:53	per0805023a
	Perchlorate Isotope Ratio			3.05			1	05-AUG-13 18:53	per0805023a
14797-73-0	Perchlorate-101	.05	.2	0.201	ug/L		1	05-AUG-13 18:53	per0805023a
	Perchlorate-O(18)			0.534	ug/L		1	05-AUG-13 18:53	per0805023a

^ 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: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CASA-13-37019MSDate Received: 24-JUL-13GEL Job No (SDG): 2013-1309GEL Sample ID: 1202916786Date Filtered: 03-AUG-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	1.01	ug/L		1	05-AUG-13 19:43	per0805029a
	Perchlorate Isotope Ratio			3.02			1	05-AUG-13 19:43	per0805029a
14797-73-0	Perchlorate-101	.05	.2	1.02	ug/L		1	05-AUG-13 19:43	per0805029a
	Perchlorate-O(18)			0.551	ug/L		1	05-AUG-13 19:43	per0805029a

^ 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: 1318124Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CASA-13-37019MSDDate Received: 24-JUL-13GEL Job No (SDG): 2013-1309GEL Sample ID: 1202916787Date Filtered: 03-AUG-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	1.02	ug/L		1	05-AUG-13 19:52	per0805030a
	Perchlorate Isotope Ratio			3.07			1	05-AUG-13 19:52	per0805030a
14797-73-0	Perchlorate-101	.05	.2	1.02	ug/L		1	05-AUG-13 19:52	per0805030a
	Perchlorate-O(18)			0.541	ug/L		1	05-AUG-13 19:52	per0805030a

^ 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 =

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

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 2013-1309**

Sample Analysis

Sample ID	Client ID
330187002	CASA-13-36995
1202929354	Method Blank (MB) ICP
1202929355	Laboratory Control Sample (LCS)
1202929358	330717010(RE43-13-38045L) Serial Dilution (SD)
1202929356	330717010(RE43-13-38045D) Sample Duplicate (DUP)
1202929357	330717010(RE43-13-38045S) Matrix Spike (MS)
1202929366	Method Blank (MB) ICP-MS
1202929367	Laboratory Control Sample (LCS)
1202929370	330453002(CAMO-13-37044L) Serial Dilution (SD)
1202929368	330453002(CAMO-13-37044D) Sample Duplicate (DUP)
1202929369	330453002(CAMO-13-37044S) Matrix Spike (MS)
1202925702	Method Blank (MB) CVAA
1202925703	Laboratory Control Sample (LCS)
1202925706	331227001(WST40-13-39399L) Serial Dilution (SD)
1202925704	331227001(WST40-13-39399D) Sample Duplicate (DUP)
1202925705	331227001(WST40-13-39399S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1323250, 1323254, 1321741 and 1324554
Prep Batch :	1323249, 1323251 and 1321738
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 26 and GL-GC-E-107 REV# 8
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

The Hardness as CaCO₃ is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 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 samples were selected as the quality control (QC) samples for this SDG: 330717010 (RE43-13-38045)-ICP, 330453002 (CAMO-13-37044)-ICP-MS and 331227001 (WST40-13-39399)-CVAA.

Matrix Spike (MS) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The 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. Dilutions were required for this SDG in order to minimize copper and tin 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: Y. Nick-Cole A. Elmore Date: 8.21.13

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: 2013-1309 GEL Work Order: 330187

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

Y. Nick-Cole A. Elmore 8.21.13

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1309**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 330187002**BASIS:** As Received**DATE COLLECTED** 23-JUL-13**CLIENT ID:** CASA-13-36995**LEVEL:** Low**DATE RECEIVED** 25-JUL-13**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	08/13/13 10:20	081313W1-10	1321741

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1309

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 330187002

BASIS: As Received

DATE COLLECTED 23-JUL-13

CLIENT ID: CASA-13-36995

LEVEL: Low

DATE RECEIVED 25-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	08/21/13 13:00	082113A-1	1323250
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	08/21/13 08:28	130820-9	1323254
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	08/20/13 15:37	130820-4	1323254
7440-39-3	Barium	69.4	ug/L		1	5	5	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-42-8	Boron	18.9	ug/L	J	15	50	50	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	08/19/13 21:24	130819-3	1323254
7440-70-2	Calcium	69700	ug/L		50	200	200	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-47-3	Chromium	406	ug/L		2	10	10	1	MS	BAJ	08/19/13 21:24	130819-3	1323254
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-50-8	Copper	50	ug/L	U	15	50	50	5	P	HSC	08/21/13 13:27	082113A-2	1323250
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	08/19/13 21:24	130819-3	1323254
7439-95-4	Magnesium	16400	ug/L		110	300	300	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7439-98-7	Molybdenum	0.655	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/20/13 15:37	130820-4	1323254
7440-02-0	Nickel	18	ug/L		0.5	2	2	1	MS	BAJ	08/21/13 07:18	130820-8	1323254
7440-09-7	Potassium	3440	ug/L		50	150	150	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	08/20/13 15:37	130820-4	1323254
7631-86-9	Silica	64400	ug/L		53	213	213	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	08/19/13 21:24	130819-3	1323254
7440-23-5	Sodium	22600	ug/L		100	300	300	1	P	HSC	08/21/13 13:00	082113A-1	1323250
7440-24-6	Strontium	326	ug/L		1	5	5	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	08/19/13 21:24	130819-3	1323254
7440-31-5	Tin	50	ug/L	U	12.5	50	50	5	P	HSC	08/21/13 13:27	082113A-2	1323250
7440-61-1	Uranium	2	ug/L		0.067	0.2	0.2	1	MS	BAJ	08/20/13 15:37	130820-4	1323254
7440-62-2	Vanadium	1.46	ug/L	J	1	5	5	1	P	HSC	08/21/13 11:47	082113A-2	1323250
7440-66-6	Zinc	9.7	ug/L	J	3.3	10	10	1	P	HSC	08/21/13 11:47	082113A-2	1323250

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1309**CONTRACT:** ESHL00210**METHOD TYPE:****SAMPLE ID:** 330187002**BASIS:** As Received**DATE COLLECTED** 23-JUL-13**CLIENT ID:** CASA-13-36995**LEVEL:** Low**DATE RECEIVED** 25-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	242	mg/L		0.453	1.24	1.24	1		JJ2	08/21/13 15:30		1324554

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1321741	1321738	EPA 245.1/245.2 Prep	20	mL	20	mL	08/12/13	AXS5
1323250	1323249	SW846 3005A	50	mL	50	mL	08/17/13	BCD1
1323254	1323251	SW846 3005A	50	mL	50	mL	08/17/13	BCD1

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. 2013-1309

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>
1202925702	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2
1202929354	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Iron	30	ug/L	+/-100	U	P	30	100
	Copper	-9.79	ug/L	+/-10	J	P	3	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Potassium	50	ug/L	+/-150	U	P	50	150
	Sodium	100	ug/L	+/-300	U	P	100	300
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Boron	15	ug/L	+/-50	U	P	15	50
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Barium	1	ug/L	+/-5	U	P	1	5
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Strontium	1	ug/L	+/-5	U	P	1	5
	Silica	53	ug/L	+/-213	U	P	53	213
	Manganese	2	ug/L	+/-10	U	P	2	10
1202929366	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	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2

*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. 2013-1309 Client ID: WST40-13-39399S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 331227001 Spike ID: 1202925705

<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	2.06		0.067	U	2	103		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1309 Client ID: RE43-13-38045S

Contract: LANL00110 Level: Low

Matrix: WATER % Solids:

Sample ID: 330717010 Spike ID: 1202929357

<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>
Aluminum	ug/L	75-125	5250		68	U	5000	104		P
Barium	ug/L	75-125	507		1	U	500	101		P
Beryllium	ug/L	75-125	519		1	U	500	104		P
Boron	ug/L	75-125	496		22.7	J	500	94.6		P
Calcium	ug/L	75-125	5260		50	U	5000	105		P
Cobalt	ug/L	75-125	514		1	U	500	103		P
Copper	ug/L	75-125	507		3	U	500	101		P
Iron	ug/L	75-125	5250		30	U	5000	105		P
Magnesium	ug/L	75-125	5330		110	U	5000	107		P
Manganese	ug/L	75-125	506		2	U	500	101		P
Potassium	ug/L	75-125	4930		50	U	5000	98.1		P
Silica	ug/L	75-125	13000		2390		10700	98.7		P
Sodium	ug/L	75-125	5720		351		5000	107		P
Strontium	ug/L	75-125	493		1	U	500	98.6		P
Tin	ug/L	75-125	510		2.5	U	500	102		P
Vanadium	ug/L	75-125	513		1	U	500	103		P
Zinc	ug/L	75-125	500		3.3	U	500	99.7		P

*Analytical Methods:

P SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1309 Client ID CAMO-13-37044S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 330453002 Spike ID: 1202929369

<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	51.1		1	U	50	102		MS
Arsenic	ug/L	75-125	52.2		3.4	J	50	97.6		MS
Cadmium	ug/L	75-125	51.2		0.11	U	50	102		MS
Chromium	ug/L	75-125	48.6		2	U	50	95.6		MS
Lead	ug/L	75-125	51		0.5	U	50	102		MS
Molybdenum	ug/L	75-125	53		1.51		50	103		MS
Nickel	ug/L	75-125	52		0.733	J	50	103		MS
Selenium	ug/L	75-125	50.7		1.5	U	50	101		MS
Silver	ug/L	75-125	52.6		0.2	U	50	105		MS
Thallium	ug/L	75-125	47.2		0.45	U	50	94.4		MS
Uranium	ug/L	75-125	54.8		1.38		50	107		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1309**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** WST40–13–39399D**Matrix:** LIQUID**Level:** Low**Sample ID:** 331227001**Duplicate ID:** 1202925704**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

***Analytical Methods:**

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1309

Lab Code: GEL

Contract: ESHL00210

Client ID: RE43–13–38045D

Matrix: LIQUID

Level: Low

Sample ID: 330717010

Duplicate ID: 1202929356

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		1 U		1 U				P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	22.7 J		22.8 J		.294		P
Calcium	ug/L		50 U		50 U				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		110 U		110 U				P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L		50 U		50 U				P
Silica	ug/L	+/-20%	2390		2400		.376		P
Sodium	ug/L	+/-300	351		398		12.4		P
Strontium	ug/L		1 U		1 U				P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L		1 U		1 U				P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005/6010B

Metals
-6-
Duplicate Sample Summary

SDG No.: 2013-1309

Lab Code: GEL

Contract: ESHL00210

Client ID: CAMO-13-37044D

Matrix: LIQUID

Level: Low

Sample ID: 330453002

Duplicate ID: 1202929368

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	+/-5	3.4 J		2.57 J		28		MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L		2 U		2 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.51		1.45		4.32		MS
Nickel	ug/L	+/-2	0.733 J		0.785 J		6.85		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	+/-20%	1.38		1.35		2.71		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-1309

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>
1202925703	Mercury	ug/L	2	2.11		106	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-1309

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>
1202929355								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	500		100	80-120	P
	Beryllium	ug/L	500	513		103	80-120	P
	Boron	ug/L	500	467		93.5	80-120	P
	Calcium	ug/L	5000	5170		103	80-120	P
	Cobalt	ug/L	500	505		101	80-120	P
	Copper	ug/L	500	502		100	80-120	P
	Iron	ug/L	5000	5170		103	80-120	P
	Magnesium	ug/L	5000	5290		106	80-120	P
	Manganese	ug/L	500	498		99.7	80-120	P
	Potassium	ug/L	5000	5000		99.9	80-120	P
	Silica	ug/L	10700	10400		96.7	80-120	P
	Sodium	ug/L	5000	5240		105	80-120	P
	Strontium	ug/L	500	494		98.8	80-120	P
	Tin	ug/L	500	498		99.7	80-120	P
	Vanadium	ug/L	500	508		102	80-120	P
	Zinc	ug/L	500	493		98.6	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-1309

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>
1202929367								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	49.3		98.6	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	49.1		98.2	80-120	MS
	Lead	ug/L	50	51		102	80-120	MS
	Molybdenum	ug/L	50	52		104	80-120	MS
	Nickel	ug/L	50	53.3		107	80-120	MS
	Selenium	ug/L	50	50.6		101	80-120	MS
	Silver	ug/L	50	52.3		105	80-120	MS
	Thallium	ug/L	50	47.4		94.9	80-120	MS
	Uranium	ug/L	50	52.5		105	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1309 **Client ID:** WST40-13-39399L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 331227001 **Serial Dilution ID:** 1202925706

<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

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1309

Client ID: RE43-13-38045L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 330717010

Serial Dilution ID: 1202929358

<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	1	U	5	U				P
Beryllium	1	U	5	U				P
Boron	22.7	J	75	U	100			P
Calcium	50	U	250	U				P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	110	U	550	U				P
Manganese	2	U	10	U				P
Potassium	50	U	392	J				P
Silica	2390		2520		5.67			P
Sodium	351		500	U	100			P
Strontium	1	U	5	U				P
Tin	2.5	U	12.5	U				P
Vanadium	1	U	5	U				P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005/6010B

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1309

Client ID: CAMO-13-37044L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 330453002

Serial Dilution ID: 1202929370

<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	3.4	J	8.5	U	100			MS
Cadmium	.11	U	.55	U				MS
Chromium	2	U	10	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.51		1.98	J	30.8			MS
Nickel	.733	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	1.38		1.46		5.21			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 2013-1309**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1318098

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
330187001	CASA-13-36991
1202916714	Method Blank (MB)
1202916715	330299001(CAMO-13-37036) Sample Duplicate (DUP)
1202916717	330299001(CAMO-13-37036) Post Spike (PS)
1202916719	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: 330299001 (CAMO-13-37036).

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: 1322097

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202926610	330090002(CASA-13-37019) Sample Duplicate (DUP)
1202926611	330453002(CAMO-13-37044) Sample Duplicate (DUP)
1202926612	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 samples were selected for QC analysis: 330090002 (CASA-13-37019) and 330453002 (CAMO-13-37044).

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: 1318848 **Method:** EPA 150.1 pH

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202918638	330187002(CASA-13-36995) Sample Duplicate (DUP)
1202918640	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: 330187002 (CASA-13-36995).

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: 330187002 (CASA-13-36995).

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: 1206840 330187002 (CASA-13-36995).

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: 1317655

Method: EPA 300.0 Anions Liquid 28 day

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202915733	Method Blank (MB)
1202915734	330087001(CAMO-13-37062) Sample Duplicate (DUP)
1202915735	330087001(CAMO-13-37062) Post Spike (PS)
1202915736	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: 330087001 (CAMO-13-37062).

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 following samples in this sample group were diluted due to high concentration: 1202915734 (CAMO-13-37062), 1202915735 (CAMO-13-37062) and 330187002 (CASA-13-36995).

Sample Re-analysis

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

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

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

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202915734 (CAMO-13-37062), 1202915735 (CAMO-13-37062) and 330187002 (CASA-13-36995).

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: 1317191 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1317190 **Method:** EEPA 350.2 Prep

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202914643	Method Blank (MB)
1202914644	Laboratory Control Sample (LCS)
1202914647	329653002(CAMO-13-36985) Sample Duplicate (DUP)
1202914648	329653002(CAMO-13-36985) 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: 329653002 (CAMO-13-36985).

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 Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1202914647 (CAMO-13-36985).

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: 1202914643 (MB).

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

The following DER was generated for this SDG: 1206647 1202914647 (CAMO-13-36985).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1318220	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1318219	Method:	EEPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
330187001	CASA-13-36991
1202917060	Method Blank (MB)
1202917061	Laboratory Control Sample (LCS)
1202917062	330301001(CAMO-13-37034) Sample Duplicate (DUP)
1202917063	330301001(CAMO-13-37034) Matrix Spike (MS)
1202921241	330187001(CASA-13-36991) Sample Duplicate (DUP)
1202921242	330187001(CASA-13-36991) 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+ 8000 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 samples were selected for QC analysis: 330187001 (CASA-13-36991) and 330301001 (CAMO-13-37034).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202917063 (CAMO-13-37034).

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: 1202917062 (CAMO-13-37034).

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1213276 1202917063 (CAMO-13-37034).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Nitrate Nitrite by Cadmium Reduction		
Analytical Batch:	1318202	Method:	EPA 353.2 Nitrogen and Nitrate/Nitrite

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202917013	Method Blank (MB)
1202917015	330187002(CASA-13-36995) Sample Duplicate (DUP)
1202917017	330187002(CASA-13-36995) Post Spike (PS)
1202917018	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: 330187002 (CASA-13-36995).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 1202917015 (CASA-13-36995), 1202917017 (CASA-13-36995) and 330187002 (CASA-13-36995).

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

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

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202914749	Method Blank (MB)
1202914750	329960002(CASA-13-36994) Sample Duplicate (DUP)
1202914752	329960002(CASA-13-36994) Matrix Spike (MS)
1202914754	Laboratory Control Sample (LCS)
1202916979	330089003(CASA-13-37021) Sample Duplicate (DUP)
1202916980	330089003(CASA-13-37021) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 10.

Preparation/Analytical Method Verification

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

Calibration Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The following samples were re-analyzed due to instrument failure: 1202914749 (MB) and 1202914754 (LCS).

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1317422

Method: EPA 160.1 Solids and Dissolved-F

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202915196	Method Blank (MB)
1202915197	330089003(CASA-13-37021) Sample Duplicate (DUP)
1202915198	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: 330089003 (CASA-13-37021).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Sample Aliquot

A sufficient amount of sample was provided by the client for analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

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: 1319311 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
330187002	CASA-13-36995
1202919729	Laboratory Control Sample (LCS)
1202919730	330187002(CASA-13-36995) Sample Duplicate (DUP)
1202919731	330187002(CASA-13-36995) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 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: 330187002 (CASA-13-36995).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

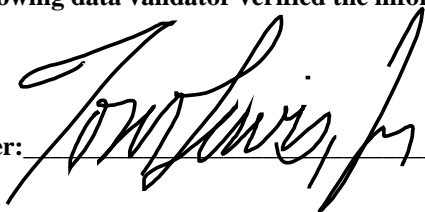
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

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

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

Reviewer:



Date:

21Aug13

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1309 GEL Work Order: 330187

The Qualifiers in this report are defined as follows:

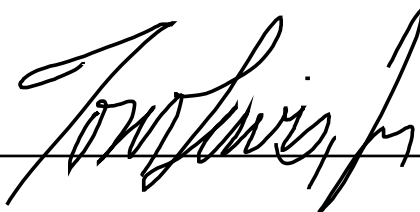
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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



GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: August 21, 2013

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-1309

Client Sample ID: CASA-13-36991
Sample ID: 330187001
Matrix: W
Collect Date: 23-JUL-13 11:22
Receive Date: 25-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		1.05	0.330	1.00	mg/L	1	TSM	07/29/13	1939	1318098	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	J	0.067	0.033	0.100	mg/L	1	KLP1	08/20/13	1408	1318220	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	08/19/13	1830	1318219

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 21, 2013

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-1309

Client Sample ID: CASA-13-36995
Sample ID: 330187002
Matrix: W
Collect Date: 23-JUL-13 11:22
Receive Date: 25-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		599	1.00	1.00	umhos/cm	1	LXA1	08/15/13	1157 1322097	1
Electrode Analysis										
EPA 150.1 pH "As Received"										
pH at Temp 18.0C	H	7.57	0.010	0.100	SU	1	LYG1	07/31/13	0937 1318848	2
Ion Chromatography										
EPA 300.0 Anions Liquid 28 day "As Received"										
Bromide		0.595	0.067	0.200	mg/L	1	VH1	08/02/13	0649 1317655	3
Fluoride		0.169	0.033	0.100	mg/L	1				
Chloride		56.4	0.670	2.00	mg/L	10	VH1	08/03/13	1722 1317655	4
Sulfate		77.9	1.33	4.00	mg/L	10				
Nutrient Analysis										
EPA 350.1 Nitrogen, Ammonia L "As Received"										
Nitrogen, Ammonia		0.452	0.017	0.050	mg/L	1	KLP1	07/30/13	1446 1317191	5
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"										
Nitrogen, Nitrate/Nitrite		4.54	0.085	0.250	mg/L	5	KLP1	08/05/13	1534 1318202	6
EPA 365.4 Phosphorus, Total in "As Received"										
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	07/30/13	1614 1317225	7
Solids Analysis										
EPA 160.1 Solids, Dissolved-F "As Received"										
Total Dissolved Solids		401	3.40	14.3	mg/L		LYG1	07/25/13	1353 1317422	8
Titration Analysis										
EPA 310.1 Total Alkalinity "As Received"										
Alkalinity, Total as CaCO3		85.3	0.725	1.00	mg/L		LXA1	08/01/13	1522 1319311	9
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	07/30/13	1300	1317190
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	07/30/13	1400	1317224

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Certificate of Analysis

Report Date: August 21, 2013

Company : Los Alamos National Laboratory
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Contact: Los Alamos, New Mexico 87545
Project: Mr. Keith Greene
LANL-WQH Water Samples

Client SDG: 2013-1309

Client Sample ID: CASA-13-36995
Sample ID: 330187002

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 300.0	
5	EPA 350.1	
6	EPA 353.2	
7	EPA 365.4	
8	EPA 160.1	
9	EPA 310.1	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: August 21, 2013

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 330187

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1318098										
QC1202916715	330299001	DUP									
Total Organic Carbon Average	J	0.456	J	0.382	mg/L	17.7	^	(+/-1.00)	TSM	07/29/13	20:46
QC1202916719	LCS										
Total Organic Carbon Average	10.0			9.45	mg/L			(85%-115%)		07/29/13	15:22
QC1202916714	MB										
Total Organic Carbon Average			U	ND	mg/L					07/29/13	15:13
QC1202916717	330299001	PS									
Total Organic Carbon Average	10.0	J	0.456	10.0	mg/L			(65%-120%)		07/29/13	21:06
Conductivity Analysis											
Batch	1322097										
QC1202926610	330090002	DUP									
Conductivity			171	175	umhos/cm	2.66		(0%-10%)	LXA1	08/15/13	11:57
QC1202926611	330453002	DUP									
Conductivity			179	184	umhos/cm	2.37		(0%-10%)		08/15/13	11:57
QC1202926612	LCS										
Conductivity	1410			1420	umhos/cm			(95%-105%)		08/15/13	11:57
Electrode Analysis											
Batch	1318848										
QC1202918638	330187002	DUP									
pH	H	7.57	H	7.58	SU	0.132		(0%-10%)	LYG1	07/31/13	09:37
QC1202918640	LCS										
pH	7.00			7.01	SU			(99%-101%)		07/31/13	09:13
Ion Chromatography											
Batch	1317655										
QC1202915734	330087001	DUP									
Bromide	U	ND	U	ND	mg/L	N/A			VH1	08/02/13	04:45
Chloride		60.5		60.9	mg/L	0.735		(0%-20%)		08/03/13	15:49
Fluoride		0.320		0.330	mg/L	2.92	^	(+/-0.100)		08/02/13	04:45
Sulfate		21.2		21.2	mg/L	0.0331		(0%-20%)		08/03/13	15:49
QC1202915736	LCS										

GEL LABORATORIES LLC

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QC Summary

Workorder: 330187

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1317655										
Bromide	1.25			1.26	mg/L		101	(90%-110%)		08/02/13	03:44
Chloride	5.00			5.03	mg/L		101	(90%-110%)	VH1		
Fluoride	2.50			2.50	mg/L		99.9	(90%-110%)			
Sulfate	10.0			10.1	mg/L		101	(90%-110%)			
QC1202915733	MB										
Bromide			U	ND	mg/L					08/02/13	03:13
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202915735	330087001	PS									
Bromide	1.25	U	ND	1.29	mg/L		99.4	(90%-110%)		08/02/13	05:16
Chloride	5.00		6.05	11.5	mg/L		109	(90%-110%)		08/03/13	16:20
Fluoride	2.50		0.320	2.67	mg/L		94	(90%-110%)		08/02/13	05:16
Sulfate	10.0		2.12	11.8	mg/L		96.7	(90%-110%)		08/03/13	16:20
Nutrient Analysis											
Batch	1317191										
QC1202914647	329653002	DUP									
Nitrogen, Ammonia		0.0886	J	0.0331	mg/L	91.2*^		(+/-0.050)	KLP1	07/30/13	14:32
QC1202914644	LCS										
Nitrogen, Ammonia	1.00			0.979	mg/L		97.9	(90%-110%)		07/30/13	14:31
QC1202914643	MB										
Nitrogen, Ammonia			J	0.0331	mg/L					07/30/13	14:42
QC1202914648	329653002	MS									
Nitrogen, Ammonia	1.00		0.0886	1.01	mg/L		92.1	(90%-110%)		07/30/13	14:33
Batch	1317225										
QC1202914750	329960002	DUP									
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A		KLP1	07/30/13	16:00
QC1202916979	330089003	DUP									
Phosphorus, Total as P			2.35	2.24	mg/L	4.79		(0%-20%)		07/30/13	16:11

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QC Summary

Workorder: 330187

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1317225										
QC1202914754 LCS											
Phosphorus, Total as P	1.00			1.03	mg/L		103	(79%-126%)	KLP1	07/30/13	16:03
QC1202914749 MB											
Phosphorus, Total as P			U	ND	mg/L					07/30/13	16:02
QC1202914752 329960002 MS											
Phosphorus, Total as P	1.00	U	ND	1.07	mg/L		107	(64%-134%)		07/30/13	16:01
QC1202916980 330089003 MS											
Phosphorus, Total as P	1.00		2.35	3.34	mg/L		99	(64%-134%)		07/30/13	16:12
Batch	1318202										
QC1202917015 330187002 DUP											
Nitrogen, Nitrate/Nitrite			4.54	3.92	mg/L	14.7		(0%-20%)	KLP1	08/05/13	15:35
QC1202917018 LCS											
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		08/05/13	15:19
QC1202917013 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					08/05/13	15:18
QC1202917017 330187002 PS											
Nitrogen, Nitrate/Nitrite	1.00		0.908	1.83	mg/L		92.2	(90%-110%)		08/05/13	15:37
Batch	1318220										
QC1202917062 330301001 DUP											
Nitrogen, Total Kjeldahl			1.45	1.31	mg/L	10.1		(0%-20%)	KLP1	08/20/13	14:31
QC1202921241 330187001 DUP											
Nitrogen, Total Kjeldahl		J	0.067	J	0.0673	mg/L	0.447 ^	(+/-0.100)		08/20/13	14:09
QC1202917061 LCS											
Nitrogen, Total Kjeldahl	1.00			1.01	mg/L		101	(90%-110%)		08/20/13	14:07
QC1202917060 MB											
Nitrogen, Total Kjeldahl			U	ND	mg/L					08/20/13	14:07
QC1202917063 330301001 MS											
Nitrogen, Total Kjeldahl	1.00		1.45	1.63	mg/L		18*	(90%-110%)		08/20/13	14:17
QC1202921242 330187001 MS											
Nitrogen, Total Kjeldahl	1.00	J	0.067	1.13	mg/L		106	(90%-110%)		08/20/13	14:10
Solids Analysis											
Batch	1317422										

GEL LABORATORIES LLC

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QC Summary

Workorder: 330187

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1317422										
QC1202915197	330089003	DUP									
Total Dissolved Solids		246		244	mg/L	0.583		(0%-10%)	LYG1	07/25/13	13:53
QC1202915198	LCS										
Total Dissolved Solids	300			290	mg/L		96.7	(95%-105%)		07/25/13	13:53
QC1202915196	MB										
Total Dissolved Solids			U	ND	mg/L					07/25/13	13:53
Titration Analysis											
Batch	1319311										
QC1202919730	330187002	DUP									
Alkalinity, Total as CaCO3		85.3		85.8	mg/L	0.608		(0%-20%)	LXA1	08/01/13	15:27
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1202919729	LCS										
Alkalinity, Total as CaCO3	50.0			52.0	mg/L		104	(90%-110%)		08/01/13	14:57
QC1202919731	330187002	MS									
Alkalinity, Total as CaCO3	50.0	85.3		137	mg/L		103	(80%-120%)		08/01/13	15:36

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.

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QC Summary

Workorder: 330187

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

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

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

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

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

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

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 30-JUL-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 350.1, EPA 350.1 SC	Matrix Type: Liquid	Client Code: SNLS, ALBR, DPNT, ESHL,
Batch ID: 1317191	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 329653(2013-1150),329660,329691,329718(2013-1172),329767(2013-1181),329854(2013-1217),329903,330187(2013-1309),330225,330240,330245,330289,330299(2013-1331),330301(2013-1334) Application Issues: Failed Recovery for MS/PS Failed RPD for DUP			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed Recovery for MS: QC 1202914650MS 2. Failed RPD for DUP: QC 1202914647DUP		1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 2. 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:

Kristen Parson 30-JUL-13

Data Validator/Group Leader:

Julia Hamilton 31-JUL-13

DATA EXCEPTION REPORT

Mo.Day Yr. 31-JUL-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1, SW846 9040B/9040C	Matrix Type: Liquid	Client Code: ESHL, SNLS
Batch ID: 1318848	Sample Numbers: See below.		
<p>Potentially affected work order(s)(SDG): 330008(2013-1262),330009(2013-1263),330020(2013-1264),330031(2013-1266),330037(2013-1267),330040(2013-1268),330089(2013-1293),330090(2013-1294),330096(2013-1296),330187(2013-1309),330193(2013-1314),330281,330299(2013-1331),330301(2013-1334),330453(2013-1370),330461(2013-1374)</p> <p>Application Issues:</p> <p>Sample received out of holding</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Sample received out of holding:</p> <p>330008 001</p> <p>330009 001</p> <p>330020 001</p> <p>330031 001</p> <p>330037 001</p> <p>330040 004</p> <p>330089 003</p> <p>330090 002</p> <p>330096 006</p> <p>330187 002</p> <p>330193 001,003</p> <p>330281 004,008</p> <p>330299 002,004,006</p> <p>330301 002</p> <p>330453 002</p> <p>330461 001</p>		<p>1. Samples were received out of holding.</p>	

Originator's Name:

Lisa Gregory 31-JUL-13

Data Validator/Group Leader:

Julia Hamilton 01-AUG-13

DATA EXCEPTION REPORT			
Mo.Day Yr. 20-AUG-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: ARSL
Batch ID: 1318220	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 330187(2013-1309),330299(2013-1331),330301(2013-1334),330721(2013-1420),330732(2013-1421),330734(2013-1423),330750(2013-1454),331377(2013-1581) Application Issues: Failed Recovery for MS/PS			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed Recovery for MS: QC 1202917063MS		1. The spike recovery falls outside of the established acceptance limits due to matrix interference.	

Originator's Name:
Kristen Parson 20-AUG-13

Data Validator/Group Leader:
Julia Hamilton 21-AUG-13