

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4050 EVENT NAME: LA/Pueblo (GS) MY2013 Q1
 Watershed Sampling
 SAMPLE ID: CALA-13-24549 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		12/12/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		0945	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	PP
LOCATION ID: Vine Tree Spring		↓	FIELD PREP:	UF	OK
LOCATION TYPE: SPR		↓	FIELD QC TYPE:	REG	↓
PORT:		↓	SAMPLE USAGE:	INV	↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

NA

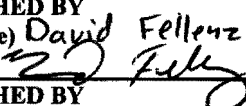
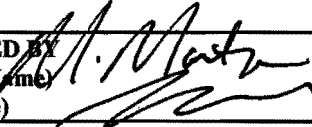

LOCATION COMMENTS:

NA

FIELD PARAMETERS:

Dissolved Oxygen 7.54 mg/L Oxidation-Reduction Potential NA MV pH 7.16 SU
 Specific Conductance 300 uS/cm Temperature 11.29 deg C Turbidity 0.59 NTU

COLLECTED BY (PRINT) A. Stocker

RELINQUISHED BY (Printed Name) David Fellenz (Signature) 	Date/Time 12/12/12 1105	RECEIVED BY (Printed Name)  (Signature) 	Date/Time 12/12/12 1105
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 11/27/2012

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4050 EVENT NAME: LA/Pueblo (GS) MY2013 Q1
 Watershed Sampling
 SAMPLE ID: CALA-13-24550 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		12/12/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		0945	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	PP
LOCATION ID: Vine Tree Spring		↓	FIELD PREP:	F	OK
LOCATION TYPE: SPR		↓	FIELD QC TYPE: REG		↓
PORT:			SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-CL04	250 ML POLY	1	ICE	Y	NA
↓	WSP-GENINORG	1 LITER POLY	1	ICE	↓	↓
↓	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3	↓	↓
↓	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) A. Stocker

RELINQUISHED BY (Printed Name) David Fellnerz (Signature) <i>David Fellnerz</i>	Date/Time 12/12/12 1105	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 12/12/12 1105
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 11/27/2012

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4050 EVENT NAME: LA/Pueblo (GS) MY2013 Q1
 Watershed Sampling
 SAMPLE ID: CALA-13-24551 WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		12/12/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		0945	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	DC
LOCATION ID: Vine Tree Spring		↓	FIELD PREP:	UF	OK
LOCATION TYPE:		↓	FIELD QC TYPE:	FTB	↓
PORT:			SAMPLE USAGE:	QC	

PRIORITY	ORDER	CONTAINER	# PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2 HCL	Y	NA

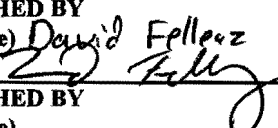
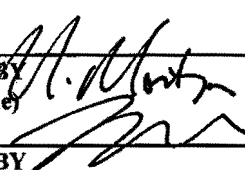

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) D. Woody

RELINQUISHED BY (Printed Name) David Felloz (Signature) 	Date/Time 12/12/12 1105	RECEIVED BY (Printed Name)  (Signature) 	Date/Time 12/12/12 1105
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 11/27/2012

Data Validation Report

Chain Of Custody No. 2013-409

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
	316677 EPA:120.1	1	1			
	316677 EPA:150.1	1	1			
	316677 EPA:160.1	1	1			
	316677 EPA:245.2	1	1			
	316677 EPA:300.0	1	1			
	316677 EPA:310.1	1	1			
	316677 EPA:350.1	1	1			
	316677 EPA:351.2	1	1			
	316677 EPA:353.2	1	1			
	316677 EPA:365.4	1	1			
	316677 SM:A2340B	1	1			
	316677 SW-846:6010B	1	1			
	316677 SW-846:6020	1	1			
	316677 SW-846:6850	1	1			
	316677 SW-846:8260B	1	1		1	
	316677 SW-846:9060	1	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
	316677 EPA:120.1	1271097	1271097	1	1						
	316677 EPA:150.1	1270434	1270434	1	1						
	316677 EPA:160.1	1270543	1270543	1	1					1	
	316677 EPA:245.2	1270929	1270926	1	1					1	1
	316677 EPA:300.0	1270140	1270140	1	1					1	
	316677 EPA:310.1	1270639	1270639	1	1					1	1
	316677 EPA:350.1	1270247	1270246	1	1					1	1
	316677 EPA:351.2	1270973	1270970	1	1					1	1
	316677 EPA:353.2	1270939	1270939	1	1					1	
	316677 EPA:365.4	1270237	1270236	1	1					1	1
	316677 SM:A2340B	1273257	1273257	1	1						
	316677 SW-846:6010B	1270441	1270440	1	1					1	1
	316677 SW-846:6020	1270573	1270572	1	1					1	1
	316677 SW-846:6850	1270699	1270697	1	1					1	1
	316677 SW-846:8260B	1271488	1271488	1	1		1			1	
	316677 SW-846:9060	1270524	1270524	1	1					1	

2. Distribution Of Analytes In EDD.

Analytical Method	Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spikes	TICS
EPA:120.1	GENERAL CHEMISTRY	CALA-13-24547	1202800144	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CALA-13-24548	1202800143	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202800145	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CALA-13-24547	1202798141	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202798143	LCS	0	0	1	0

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

EPA:160.1	GENERAL CHEMISTRY	Buckman01-12-24575	1202798632	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202798635	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202798631	MB	1	0	0	0
EPA:245.2	INORGANIC	CALA-13-24550	1202799645	DUP	1	0	0	0
EPA:245.2	INORGANIC	CALA-13-24550	1202799646	MS	0	0	1	0
EPA:245.2	INORGANIC	CALA-13-24550	316677002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202799644	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202799643	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CALA-13-24548	1202797072	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202797074	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202797071	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CALA-13-24548	1202798935	DUP	3	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CALA-13-24548	1202798936	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202798934	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202798937	MB	3	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CALA-13-24550	1202797522	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CALA-13-24550	1202797523	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202797521	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202797520	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CALA-13-24545	1202799788	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CALA-13-24545	1202799790	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CALA-13-24549	316677001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202799792	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202799787	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CALA-13-24550	1202799685	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202799682	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202799681	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CALA-13-24550	1202797496	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CALA-13-24550	1202797497	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CALA-13-24550	316677002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202797495	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202797494	MB	1	0	0	0
SM:A2340B	INORGANIC	CALA-13-24550	316677002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CALA-13-24550	1202798223	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CALA-13-24550	1202798224	MS	0	0	17	0
SW-846:6010B	INORGANIC	CALA-13-24550	316677002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202798222	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202798221	MB	17	0	0	0
SW-846:6020	INORGANIC	CALA-13-24550	1202798745	DUP	11	0	0	0
SW-846:6020	INORGANIC	CALA-13-24550	1202798746	MS	0	0	11	0
SW-846:6020	INORGANIC	CALA-13-24550	316677002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202798744	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202798743	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CALA-13-24548	1202799061	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CALA-13-24548	1202799062	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CALA-13-24550	316677002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202799060	LCS	0	0	1	0

SW-846:6850	LCMS/MS PERCHLORATE	MB	1202799059	MB	1	0	0	0
SW-846:82608	VOC	CALA-13-24549	316677001	REG	80	3	0	0
SW-846:82608	VOC	CALA-13-24551	316677003	FTB	80	3	0	0
SW-846:82608	VOC	LCS	1202801063	LCS	0	3	70	0
SW-846:82608	VOC	LCS	1202801064	LCS	0	3	10	0
SW-846:82608	VOC	MB	1202801060	MB	80	3	0	0
SW-846:9060	GENERAL CHEMISTRY	CALA-13-24546	1202798557	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CALA-13-24549	316677001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202798559	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202798556	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	1202797494	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0294	J	mg/L	0.05
MB	1202798221	METHOD BLANK	SW-846:60108	W	Potassium	70.2	J	ug/L	150
MB	1202798743	METHOD BLANK	SW-846:6020	W	Chromium	2.35	J	ug/L	10
MB	1202798743	METHOD BLANK	SW-846:6020	W	Molybdenum	0.169	J	ug/L	0.5

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
CALA-13-24550	MB	1202798743	METHOD BLANK	SW-846:6020	Chromium	ug/L	2.35	4.6	J	10	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field	Matrix	Matrix	Analytical	Parameter	Analysis	Analysis	Sample	MS %	MSD %	Upper	Lower
Sample ID	Spike ID	Spike Dup ID	Method	Name	Lot ID	Date	Matrix	Recvry	Recvry	Limit	Limit
CALA-13-24550	1202797523		EPA:350.1	Ammonia as Nitrogen	1270246	12/19/2012	W	114		110	90
CALA-13-24550	1202797523		EPA:350.1	Ammonia as Nitrogen	1270246	12/19/2012	W	114		110	90
CALA-13-24545	1202799790		EPA:351.2	Total Kjeldahl Nitrogen	1270970	12/27/2012	W	80		110	90

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

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

Rejection	RPD	RPD
Limit		
10		
10		
10		

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

None.

13. Display Flagged Data.

Location ID	Chain Of Custody No	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detected
Vine Tree Spring	2013-409	CALA-13-24550	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	J+	I6b	Y
Vine Tree Spring	2013-409	CALA-13-24550	REG	INIT	INORGANIC	SW-846:6020	Chromium	J	U	I4	N

Reason Code	Description
I4	the sample result is $\leq 5 \times$ the concentration of related analyte in the method blank.
I6b	The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.
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
CALA-13-24549	Vine Tree Spring	REG	EPA:351.2	0	1
CALA-13-24549	Vine Tree Spring	REG	SW-846:8260B	0	80
CALA-13-24549	Vine Tree Spring	REG	SW-846:9060	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:120.1	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:150.1	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:160.1	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:245.2	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:300.0	0	4
CALA-13-24550	Vine Tree Spring	REG	EPA:310.1	0	2
CALA-13-24550	Vine Tree Spring	REG	EPA:350.1	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:353.2	0	1
CALA-13-24550	Vine Tree Spring	REG	EPA:365.4	0	1
CALA-13-24550	Vine Tree Spring	REG	SM:A2340B	0	1
CALA-13-24550	Vine Tree Spring	REG	SW-846:6010B	0	17
CALA-13-24550	Vine Tree Spring	REG	SW-846:6020	0	11
CALA-13-24550	Vine Tree Spring	REG	SW-846:6850	0	1
CALA-13-24551	Vine Tree Spring	FTB	SW-846:8260B	0	80

Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent Moisture	Analysis Lot ID	Validation Status Code	Use Flag
0.0476	mg/L	0.0476	mg/L			W	12/12/2012		1270247	VAL	Y
4.6	ug/L	4.6	ug/L			W	12/12/2012		1270573	VAL	Y



January 07, 2013

www.gel.com

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

Re: LANL-WQH Water Samples
Work Order: 316677
SDG: 2013-409

Dear Keith Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on December 13, 2012, and analyzed for GC/MS Volatile, 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: 2013-409
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 316677
SDG: 2013-409

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 316677
SDG # : 2013-409**

January 08, 2013

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on December 13, 2012 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
316677001	CALA-13-24549
316677002	CALA-13-24550
316677003	CALA-13-24551

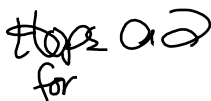
Case Narrative

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: GC/MS Volatile, 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 07 January 2013

State	Certification
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	LA120008
Maryland	270
Massachusetts	M-SC012
Mississippi	SC00012
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	T104704235-12-7
Utah NELAP	SC00012
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation

COC/Lab Request #:
2013-409

2013-409

Page 1 of 1

316677

[illegible]

SAMPLE RECEIPT & REVIEW FORM

Client: LANL			SDG/AR/COC/Work Order: 2013-409		
Received By: Patricia Dent			Date Received: December 13, 2012		
Suspected Hazard Information		Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?			X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM	
Classified Radioactive II or III by RSO?			X	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?			X		
Package, COC, and/or Samples marked as beryllium or asbestos containing?			X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?			X	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?			X		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ deg. C)?*	X			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 3-5,15C
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 61524646
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	X			Sample ID's, containers affected and observed pH: If Preservation added, Lot#
6 VOA vials free of headspace (defined as < 6mm bubble)?	X			Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?			X	Sample ID's affected: CALA-13-24551 for 8260b the lab rec'd 1 container coc indicates 2.
12 Are sample containers identifiable as GEL provided?			X	
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.	X			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 5462 9832 6190 3C 5462 9832 6178 4C 5462 9832 6215 5C 5462 9832 6204 15C 5462 9832 6189 15C

Comments (Use Continuation Form if needed):

Subject: Sample receipt issues from 12/13/12
From: Pat Dent <Pat.Dent@gel.com>
Date: 12/13/2012 6:42 PM
To: "Keith R. Greene" <kgreene@lanl.gov>
CC: "team.davis" <team.davis@gel.com>, LANL@amrad.com

Good evening all listed below are today's issues

Containers for Gross A/B was preserved prior to analysis.

RN#2013-409

Sample ID CALA-13-24551 the lab rec'd 1 8260b container instead of 2 as indicated on coc.

RN#2013-396

Sample ID Buckman06-12-24580 the lab rec'd 1 8260b container instead of 2 as indicated on coc.

Buckman06-12-24578 the lab rec'd 2 containers each for PCB, HEXP instead of 3 as indicated on coc.

RN#2013-397

Sample ID Buckman01-12-24577 the lab rec'd 1 8260b container instead of 2 as indicated on coc.

Buckman01-12-24575 the lab rec'd 2 containers each for PCB, HEXP instead of 3 as indicated on coc. 1 HEXP container was rec'd broken in plastic bag, lab was able to retrieve 250ml.

RN#20213-398

Sample ID Buckman08-12-24583 the lab rec'd 1 8260b container instead of 2 as indicated on coc.

Buckman08-12-24581 the lab rec'd 2 containers each for PCB, HEXP 1 PCB container was rec'd broken.

Thanks!!

--

Patricia Dent
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Rd.
Charleston, S.C. 29407
Main: 843-556-8171 Ext 4264
Fax: 843-766-1178
Email: pad@gel.com
Web: www.gel.com

SHIP DATE: 12DEC12
ACTWGT: 49.0 LB MAN
CAD: 0014176/CRFE2511

BILL SENDER

ORIGIN ID: SAFA (505) 665-9966

KEITH GREENE
LOS ALAMOS NATL DPU 03
1400 BLDG 1237 87545
LOS ALAMOS NM 87545
UNITED STATES US

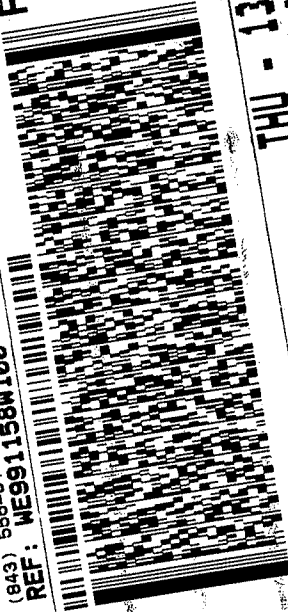
3C

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
GENERAL ENGINEERING RD
2040 SAVAGE RD
CHARLESTON SC 29407

REF: WE991158W100

(843) 566-8171

FedEx
Express



THU - 13 DEC A1
PRIORITY OVERNIGHT

1 of 3

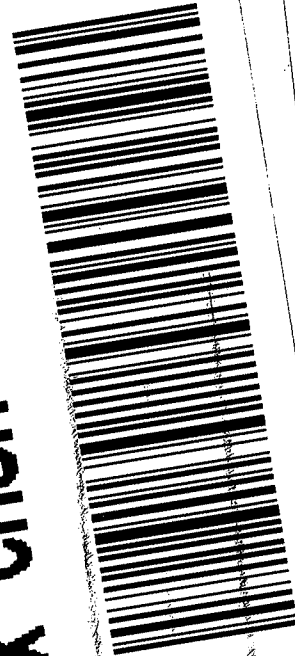
TRK# 5462 9832 6190

0201

MASTER #

29407
SC-US CHS

XX CHSA



Part # 150148-434 R17206/10

ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TAD0 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

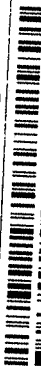
SHIP DATE: 12DEC12
ACTUAL: 48 0 LB MCM
CAD: 00714176/CAFE25

BILL SENDER

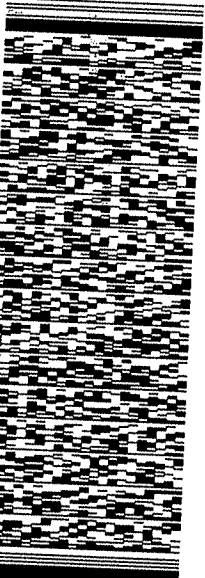
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

WTC

CHARLESTON SC 29407
(843) 556-8171
REF: WE991158W100



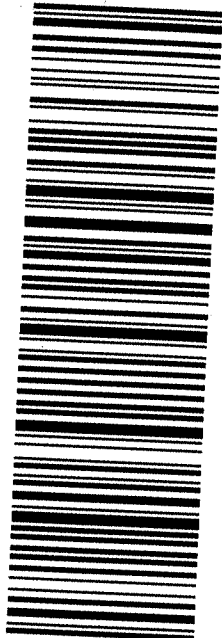
FedEx
Express



1 of 2
TRK# 5462 9832 6178
0201
HH MASTER HH
THU - 13 DEC A1
PRIORITY OVERNIGHT

XX CHSA

29407
SC-US CHS



Part # 150148-434 R1T2 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: 12DEC12
ACTWGT: 35.0 LB MAN
CRD: 0014176/CAFE2511

BILL SENDER

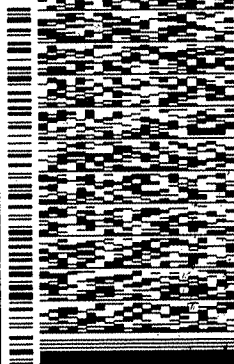
TO **VALERIE DAVIS**

**GENERAL ENGINEERING LAB
2040 SAVAGE RD**

CHARLESTON SC 29407

(843) 556-8171
REF: WE991158W100

5C



FedEx
Express



3 of 3

MPS# 5462 9832 6215

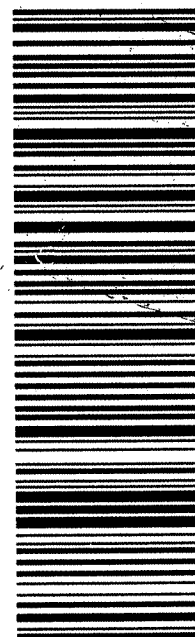
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XX CHSA

THU - 13 DEC A1
PRIORITY OVERNIGHT

0201

29407
SC-US CHS



Part # 156148-434 R1T2 09/10

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

BILL SENDER

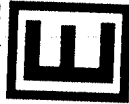
VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: WE991158W100

150

FedEx
Express



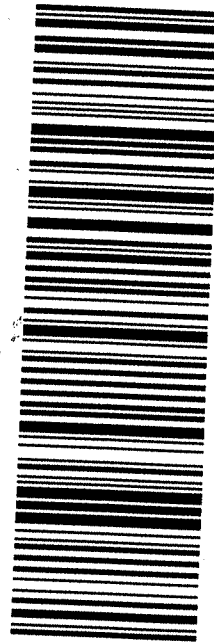
THU - 13 DEC A1
PRIORITY OVERNIGHT

0201

2 of 3
MPS# 5462 9832 6204
Mstr# 5462 9832 6190

XX CHSA

29407
SC-US CHS



Part # 156148-434 RIT2 08/10

SHIP DATE: 12DEC12
ACTING: 55.0 18 MAN
CAD: 0014176/CAFE2511

ORIGIN ID: SAFA (505) 665-9966

KEITH GREENE
LOS ALAMOS NATL LAB
1400 BLDG 1237 DPU 03

BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

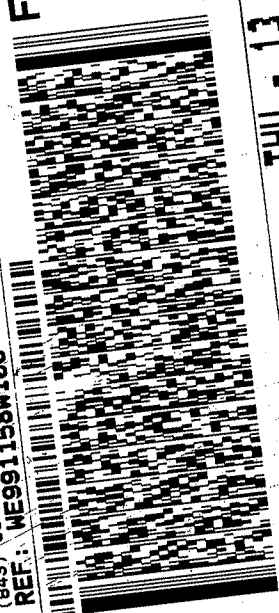
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

15C

CHARLESTON SC 29407

(843) 566-8171
REF: WE991158W100

FedEx
Express



THU - 13 DEC A1
PRIORITY OVERNIGHT

2 of 2

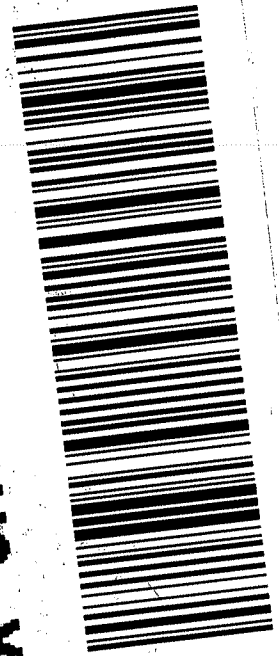
MPS# 5462 9832 6189

0201

Mstr# 5462 9832 6178

29407
SC-US CHS

XX CHSA



Part # 156148-434 R172 08/10

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.

Volatile Analysis

Case Narrative

**ChemStation Case Narrative
ARS International (ARSL)
SDG 2013-409**

Method/Analysis Information

Procedure: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 8260B DOE-AL

Analytical Batch Number: 1271488

Sample Analysis

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

Sample ID	Client ID
316677001	CALA-13-24549
316677003	CALA-13-24551
1202801060	Method Blank (MB)
1202801061	316889001(CAWA-13-24552) Post Spike (PS)
1202801062	316889001(CAWA-13-24552) Post Spike Duplicate (PSD)
1202801063	Laboratory Control Sample (LCS)
1202801064	Laboratory Control Sample (LCS)

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

The 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-038 REV# 18.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a 'd' qualifier.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were

added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

At the request of the client, linear curve fits, for target analytes that did not meet the x-intercept criteria of less than or equal to 3 times the MDL and had %RSDs less than 60%, were set to use the average response factor to quantitate data in this SDG.

Continuing Calibration Verification Requirements

All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 316889001 (CAWA-13-24552) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike recoveries were within the required acceptance limits.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information

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.

Manual Integrations

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

TIC Comment

Tentatively identified compounds (TIC) may be requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data, if requested, are included on the Sample Data Summary (Form I) and are also included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA9.I	Agilent 6890/5973 GC/MS w/ OI Eclipse/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all 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: 2013-409 GEL Work Order: 316677

The Qualifiers in this report are defined as follows:

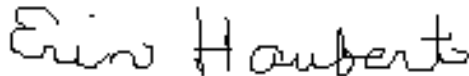
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- 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: Erin Haubert

Date: 08 JAN 2013

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409
Lab Sample ID: 316677001

Date Collected: 12/12/2012 09:45
Date Received: 12/13/2012 08:50

Matrix: W

Client ID: CALA-13-24549

Client: ARSL001

Project: ESHL00210

Batch ID: 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 12/19/2012 13:36

Inst: VOA9.I

Dilution: 1

Prep Date: 12/19/2012 13:36

Analyst: RXY1

Purge Vol: 5 mL

Data File: 121912V9\9R314.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
67-64-1	Acetone	U	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	3.00	10.0
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2013-409
Lab Sample ID: 316677001

Date Collected: 12/12/2012 09:45
Date Received: 12/13/2012 08:50

Matrix: W

Client ID: CALA-13-24549

Client: ARSL001

Project: ESHL00210

Batch ID: 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 12/19/2012 13:36

Inst: VOA9.I

Dilution: 1

Prep Date: 12/19/2012 13:36

Analyst: RXY1

Purge Vol: 5 mL

Data File: 121912V9\9R314.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
91-20-3	Naphthalene	U	1.00	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409
Lab Sample ID: 316677001

Date Collected: 12/12/2012 09:45
Date Received: 12/13/2012 08:50

Matrix: W

Client ID: CALA-13-24549

Client: ARSL001

Project: ESHL00210

Batch ID: 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 12/19/2012 13:36

Inst: VOA9.I

Dilution: 1

Prep Date: 12/19/2012 13:36

Analyst: RXY1

Purge Vol: 5 mL

Data File: 121912V9\9R314.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	57.7	50.0	ug/L 115	(78%-124%)
Bromofluorobenzene	54.2	50.0	ug/L 108	(80%-120%)
Toluene-d8	52.7	50.0	ug/L 105	(80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	4.33	16.7	ug/L	0	J
	unknown siloxane	14.77	6.74	ug/L	0	J
	unknown siloxane	16.738	27	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409
Lab Sample ID: 316677003

Date Collected: 12/12/2012 09:45
Date Received: 12/13/2012 08:50

Matrix: W

Client ID: CALA-13-24551

Client: ARSL001

Project: ESHL00210

Batch ID: 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 12/19/2012 10:50

Inst: VOA9.I

Dilution: 1

Prep Date: 12/19/2012 10:50

Analyst: RXY1

Purge Vol: 5 mL

Data File: 121912V9\9R308.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
67-64-1	Acetone	U	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	3.00	10.0
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409
Lab Sample ID: 316677003

Date Collected: 12/12/2012 09:45
Date Received: 12/13/2012 08:50

Matrix: W

Client ID: CALA-13-24551

Client: ARSL001

Project: ESHL00210

Batch ID: 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Run Date: 12/19/2012 10:50

Inst: VOA9.I

Dilution: 1

Prep Date: 12/19/2012 10:50

Analyst: RXY1

Purge Vol: 5 mL

Data File: 121912V9\9R308.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
91-20-3	Naphthalene	U	1.00	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409

Lab Sample ID: 316677003

Date Collected: 12/12/2012 09:45

Date Received: 12/13/2012 08:50

Matrix: W

Client: ARSL001

Project: ESHL00210

Client ID: CALA-13-24551

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1271488

Inst: VOA9.I

Dilution: 1

Run Date: 12/19/2012 10:50

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 12/19/2012 10:50

Data File: 121912V9\9R308.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.7	50.0	ug/L 107	(78%-124%)
Bromofluorobenzene	51.0	50.0	ug/L 102	(80%-120%)
Toluene-d8	51.0	50.0	ug/L 102	(80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	4.301	11.4	ug/L	0	J
	unknown siloxane	16.738	20.4	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2013-409**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1202801063	LCS for batch 1271488	100	95	95
1202801064	LCS for batch 1271488	97	98	96
1202801060	MB for batch 1271488	100	97	100
316677003	CALA-13-24551	107	102	102
316677001	CALA-13-24549	115	105	108
1202801061	CAWA-13-24552PS	103	101	101
1202801062	CAWA-13-24552PSD	104	99	100

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4 (78%-124%)

TOL = Toluene-d8 (80%-120%)

BFB = Bromofluorobenzene (80%-120%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2013-409

Sample Type: Post Spike

Client ID: CAWA-13-24552PS

Matrix: W

Lab Sample ID: 1202801061

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:23

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	44.4	89	36-123
74-87-3	PS Chloromethane	50.0	0.00 U	48.8	98	47-134
75-01-4	PS Vinyl chloride	50.0	0.00 U	39.8	80	49-129
74-83-9	PS Bromomethane	50.0	0.00 U	49.1	98	56-127
75-00-3	PS Chloroethane	50.0	0.00 U	47.5	95	67-122
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	45.3	91	60-123
60-29-7	PS Ethyl ether	50.0	0.00 U	45.3	91	69-121
67-64-1	PS Acetone	250	0.00 U	119	48	30-143
75-05-8	PS Acetonitrile	1250	0.00 U	1110	89	60-133
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	47.3	95	67-132
74-88-4	PS Iodomethane	250	0.00 U	204	82	69-147
75-09-2	PS Methylene chloride	50.0	0.00 U	48.0	96	56-135
75-15-0	PS Carbon disulfide	250	0.00 U	261	105	65-153
1634-04-4	PS tert-Butyl methyl ether	50.0	0.670 J	46.9	93	73-126
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	46.4	93	69-128
108-05-4	PS Vinyl acetate	250	0.00 U	232	93	50-143
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	47.4	95	75-124
78-93-3	PS 2-Butanone	250	0.00 U	158	63	30-140
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	46.1	92	52-147
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	47.7	95	67-143
67-66-3	PS Chloroform	50.0	0.00 U	47.1	94	75-125
74-97-5	PS Bromochloromethane	50.0	0.00 U	44.0	88	80-120

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2013-409

Sample Type: Post Spike

Client ID: CAWA-13-24552PS

Matrix: W

Lab Sample ID: 1202801061

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:23

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	48.5	97	69-140
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	47.6	95	71-130
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5340	107	53-150
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	49.8	100	69-142
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	47.5	95	72-126
71-43-2	PS Benzene	50.0	0.00 U	45.7	91	73-119
79-01-6	PS Trichloroethylene	50.0	0.690 J	47.8	94	54-147
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	45.6	91	78-123
75-27-4	PS Bromodichloromethane	50.0	0.00 U	52.1	104	76-131
74-95-3	PS Dibromomethane	50.0	0.00 U	47.0	94	79-120
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	224	90	68-136
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	50.9	102	72-134
108-88-3	PS Toluene	50.0	0.00 U	46.4	93	62-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	51.6	103	72-133
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	48.9	98	74-120
591-78-6	PS 2-Hexanone	250	0.00 U	178	71	31-132
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	46.8	94	73-121
127-18-4	PS Tetrachloroethylene	50.0	0.770 J	43.6	86	54-139
124-48-1	PS Dibromochloromethane	50.0	0.00 U	52.1	104	74-128
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	47.4	95	80-120
108-90-7	PS Chlorobenzene	50.0	0.00 U	45.4	91	73-119
100-41-4	PS Ethylbenzene	50.0	0.00 U	45.5	91	66-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2013-409

Sample Type: Post Spike

Client ID: CAWA-13-24552PS

Matrix: W

Lab Sample ID: 1202801061

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:23

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00	U 92.5	93	56-134
95-47-6	PS o-Xylene	50.0	0.00	U 45.2	90	68-126
100-42-5	PS Styrene	50.0	0.00	U 47.1	94	57-138
75-25-2	PS Bromoform	50.0	0.00	U 52.3	105	66-129
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00	U 47.4	95	44-146
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00	U 45.8	92	68-129
108-86-1	PS Bromobenzene	50.0	0.00	U 43.6	87	70-122
103-65-1	PS n-Propylbenzene	50.0	0.00	U 45.0	90	61-131
95-49-8	PS 2-Chlorotoluene	50.0	0.00	U 44.3	89	66-126
98-82-8	PS Isopropylbenzene	50.0	0.00	U 46.2	92	65-130
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00	U 46.2	92	58-134
106-43-4	PS 4-Chlorotoluene	50.0	0.00	U 46.5	93	63-125
98-06-6	PS tert-Butylbenzene	50.0	0.00	U 46.3	93	66-129
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00	U 46.2	92	60-131
135-98-8	PS sec-Butylbenzene	50.0	0.00	U 46.1	92	62-130
99-87-6	PS 4-Isopropyltoluene	50.0	0.00	U 46.0	92	62-132
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00	U 44.2	88	66-121
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00	U 43.6	87	65-119
104-51-8	PS n-Butylbenzene	50.0	0.00	U 47.0	94	55-134
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00	U 51.5	103	58-137
87-68-3	PS Hexachlorobutadiene	50.0	0.00	U 46.0	92	49-139
91-20-3	PS Naphthalene	50.0	0.00	U 45.8	92	46-145

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2013-409

Sample Type: Post Spike

Client ID: CAWA-13-24552PS

Matrix: W

Lab Sample ID: 1202801061

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:23

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	43.8	88	54-134
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	49.3	99	79-128
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	43.8	88	55-128
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	44.5	89	68-121

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2013-409

Sample Type: Post Spike Duplicate

Client ID: CAWA-13-24552PSD

Matrix: W

Lab Sample ID: 1202801062

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:50

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	45.8	92	36-123	3	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	50.8	102	47-134	4	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	43.8	88	49-129	10	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	49.0	98	56-127	0	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	47.3	95	67-122	0	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	46.2	92	60-123	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	47.5	95	69-121	5	0-20
67-64-1	PSD Acetone	250	0.00 U	135	54	30-143	12	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1230	98	60-133	10	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	47.4	95	67-132	0	0-20
74-88-4	PSD Iodomethane	250	0.00 U	210	84	69-147	3	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	47.4	95	56-135	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	257	103	65-153	2	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.670 J	49.2	97	73-126	5	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	46.9	94	69-128	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	247	99	50-143	6	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	47.3	95	75-124	0	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	181	73	30-140	14	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	46.6	93	52-147	1	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	48.1	96	67-143	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	47.1	94	75-125	0	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	46.2	92	80-120	5	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2013-409

Sample Type: Post Spike Duplicate

Client ID: CAWA-13-24552PSD

Matrix: W

Lab Sample ID: 1202801062

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:50

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 49.6	99	69-140	2	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 47.9	96	71-130	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00	U 6110	122	53-150	14	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 50.4	101	69-142	1	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 49.2	98	72-126	4	0-20
71-43-2	PSD Benzene	50.0	0.00	U 45.6	91	73-119	0	0-20
79-01-6	PSD Trichloroethylene	50.0	0.690	J 48.2	95	54-147	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 46.2	92	78-123	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 51.6	103	76-131	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 49.3	99	79-120	5	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	U 248	99	68-136	10	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 51.3	103	72-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00	U 45.3	91	62-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 52.0	104	72-133	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 50.2	100	74-120	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00	U 200	80	31-132	12	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 48.2	96	73-121	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.770	J 45.0	89	54-139	3	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 53.2	106	74-128	2	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 49.5	99	80-120	4	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 45.8	92	73-119	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 45.6	91	66-125	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2013-409

Sample Type: Post Spike Duplicate

Client ID: CAWA-13-24552PSD

Matrix: W

Lab Sample ID: 1202801062

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:50

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00	U 92.4	92	56-134	0	0-20
95-47-6	PSD o-Xylene	50.0	0.00	U 44.8	90	68-126	1	0-20
100-42-5	PSD Styrene	50.0	0.00	U 46.6	93	57-138	1	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 56.1	112	66-129	7	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 50.3	101	44-146	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 50.3	101	68-129	9	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 44.2	88	70-122	2	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 44.9	90	61-131	0	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 44.6	89	66-126	1	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 45.7	91	65-130	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 45.3	91	58-134	2	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 45.5	91	63-125	2	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 46.9	94	66-129	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 45.5	91	60-131	1	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 45.8	92	62-130	1	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 46.1	92	62-132	0	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 44.6	89	66-121	1	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 43.6	87	65-119	0	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 46.3	93	55-134	1	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 62.5	125	58-137	19	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 46.4	93	49-139	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 50.1	100	46-145	9	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2013-409

Sample Type: Post Spike Duplicate

Client ID: CAWA-13-24552PSD

Matrix: W

Lab Sample ID:1202801062

Instrument: VOA9.I

Analysis Date: 12/19/2012 16:50

Dilution: 1

Analyst: RXY1

Prep Batch ID 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	45.4	91	54-134	4	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	49.9	100	79-128	1	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	44.7	89	55-128	2	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	45.6	91	68-121	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

SDG Number: 2013-409

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1271488

Matrix: WATER

Lab Sample ID: 1202801063

Instrument: VOA9.I

Analysis Date: 12/19/2012 08:34

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	46.5	93	39-124
74-87-3	LCS Chloromethane	50.0	0.0	52.7	105	57-126
75-01-4	LCS Vinyl chloride	50.0	0.0	47.9	96	62-121
74-83-9	LCS Bromomethane	50.0	0.0	49.6	99	68-120
75-00-3	LCS Chloroethane	50.0	0.0	50.1	100	73-120
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	48.5	97	65-123
60-29-7	LCS Ethyl ether	50.0	0.0	47.9	96	74-120
67-64-1	LCS Acetone	250	0.0	253	101	36-163
75-05-8	LCS Acetonitrile	1250	0.0	1180	95	64-127
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	49.8	100	76-127
74-88-4	LCS Iodomethane	250	0.0	227	91	80-134
75-09-2	LCS Methylene chloride	50.0	0.0	47.3	95	72-121
75-15-0	LCS Carbon disulfide	250	0.0	270	108	80-143
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	49.2	98	76-123
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	48.5	97	77-123
108-05-4	LCS Vinyl acetate	250	0.0	258	103	75-144
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	48.3	97	79-120
78-93-3	LCS 2-Butanone	250	0.0	284	113	46-158
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	48.5	97	80-122
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	53.1	106	76-145
67-66-3	LCS Chloroform	50.0	0.0	47.2	94	80-120
74-97-5	LCS Bromochloromethane	50.0	0.0	47.8	96	83-120

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2013-409

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1271488

Matrix: WATER

Lab Sample ID: 1202801063

Instrument: VOA9.I

Analysis Date: 12/19/2012 08:34

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	51.9	104	80-133
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	49.1	98	80-127
71-36-3	LCS n-Butyl alcohol	5000	0.0	5650	113	66-138
56-23-5	LCS Carbon tetrachloride	50.0	0.0	53.9	108	77-139
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	47.7	95	75-121
71-43-2	LCS Benzene	50.0	0.0	47.4	95	79-120
79-01-6	LCS Trichloroethylene	50.0	0.0	50.3	101	80-121
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	47.0	94	80-120
75-27-4	LCS Bromodichloromethane	50.0	0.0	51.6	103	80-127
74-95-3	LCS Dibromomethane	50.0	0.0	50.1	100	80-120
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	256	102	76-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	51.5	103	80-127
108-88-3	LCS Toluene	50.0	0.0	46.2	92	77-120
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	51.0	102	80-128
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	46.6	93	79-120
591-78-6	LCS 2-Hexanone	250	0.0	287	115	53-158
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	45.1	90	77-120
127-18-4	LCS Tetrachloroethylene	50.0	0.0	47.4	95	77-125
124-48-1	LCS Dibromochloromethane	50.0	0.0	52.1	104	77-126
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	48.2	96	80-120
108-90-7	LCS Chlorobenzene	50.0	0.0	46.2	92	80-120
100-41-4	LCS Ethylbenzene	50.0	0.0	46.4	93	78-120

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2013-409

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1271488

Matrix: WATER

Lab Sample ID: 1202801063

Instrument: VOA9.I

Analysis Date: 12/19/2012 08:34

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	96.4	96	79-120
95-47-6	LCS o-Xylene	50.0	0.0	46.7	93	80-120
100-42-5	LCS Styrene	50.0	0.0	48.8	98	80-121
75-25-2	LCS Bromoform	50.0	0.0	55.6	111	72-125
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	47.3	95	73-120
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	48.2	96	74-121
108-86-1	LCS Bromobenzene	50.0	0.0	46.2	92	79-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	47.0	94	75-125
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	46.8	94	77-121
98-82-8	LCS Isopropylbenzene	50.0	0.0	47.8	96	76-125
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	48.0	96	77-123
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	47.4	95	75-120
98-06-6	LCS tert-Butylbenzene	50.0	0.0	49.2	98	79-123
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	47.6	95	77-121
135-98-8	LCS sec-Butylbenzene	50.0	0.0	48.3	97	76-124
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	48.9	98	79-125
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	47.2	94	78-120
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	46.2	92	77-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	48.8	98	75-127
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	58.0	116	69-128
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	49.8	100	75-128
91-20-3	LCS Naphthalene	50.0	0.0	49.2	98	71-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2013-409

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1271488

Matrix: WATER

Lab Sample ID:1202801063

Instrument: VOA9.I

Analysis Date: 12/19/2012 08:34

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	47.9	96	73-125
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	51.0	102	80-124
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	49.2	98	75-123
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	46.9	94	79-120

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2013-409

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1271488

Matrix: WATER

Lab Sample ID: 1202801064

Instrument: VOA9.I

Analysis Date: 12/19/2012 09:29

Dilution: 1

Analyst: RXY1

Prep Batch ID: 1271488

Purge Vol: 5 mL

Batch ID: 1271488

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	218	87	28-152
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	248	99	65-157
107-05-1	LCS Allyl chloride	250	0.0	220	88	60-135
107-13-1	LCS Acrylonitrile	250	0.0	214	85	64-131
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	50.1	100	45-159
107-12-0	LCS Propionitrile	250	0.0	219	88	67-135
126-98-7	LCS Methacrylonitrile	250	0.0	217	87	64-132
78-83-1	LCS Isobutyl alcohol	2500	0.0	2210	88	60-136
80-62-6	LCS Methyl methacrylate	250	0.0	210	84	66-129
97-63-2	LCS Ethyl methacrylate	250	0.0	220	88	66-132

Method Blank Summary

Page 1 of 1

SDG Number:	2013-409	Client:	ARSL001	Matrix:	WATER
Client ID:	MB for batch 1271488	Instrument ID:	VOA9.I	Data File:	121912V9\9R306B.D
Lab Sample ID:	1202801060	Prep Date:	12/19/2012 09:56	Analyzed:	12/19/12 09:56
Column:	DB-624				

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1271488	1202801063	121912V9\9R303L.D	12/19/12	0834
02 LCS for batch 1271488	1202801064	121912V9\9R305L.D	12/19/12	0929
03 CALA-13-24551	316677003	121912V9\9R308.D	12/19/12	1050
04 CALA-13-24549	316677001	121912V9\9R314.D	12/19/12	1336
05 CAWA-13-24552PS	1202801061	121912V9\9R320.D	12/19/12	1623
06 CAWA-13-24552PSD	1202801062	121912V9\9R321.D	12/19/12	1650

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409

Matrix: WATER

Lab Sample ID: 1202801060

Client Sample: QC for batch 1271488

Client: ARSL001

Project: QC

Client ID: MB for batch 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1271488

Inst: VOA9.I

Dilution: 1

Run Date: 12/19/2012 09:56

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 12/19/2012 09:56

Data File: 121912V9\9R306B.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
67-64-1	Acetone	U	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	3.00	10.0
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409

Matrix: WATER

Lab Sample ID: 1202801060

Client Sample: QC for batch 1271488

Client: ARSL001

Project: QC

Client ID: MB for batch 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1271488

Inst: VOA9.I

Dilution: 1

Run Date: 12/19/2012 09:56

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 12/19/2012 09:56

Data File: 121912V9\9R306B.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
91-20-3	Naphthalene	U	1.00	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409	Matrix: WATER	
Lab Sample ID: 1202801060		
Client Sample: QC for batch 1271488	Client: ARSL001	Project: QC
Client ID: MB for batch 1271488	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1271488	Inst: VOA9.I	Dilution: 1
Run Date: 12/19/2012 09:56	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 12/19/2012 09:56		
Data File: 121912V9\9R306B.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.9	50.0	99.8	(78%-124%)
Bromofluorobenzene	49.8	50.0	99.6	(80%-120%)
Toluene-d8	48.7	50.0	97.4	(80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	4.301	6.17	ug/L	0	J
	unknown siloxane	16.738	8.43	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409	Date Collected: 12/13/2012 15:33	Matrix: W
Lab Sample ID: 1202801061	Date Received: 12/18/2012 09:55	
Client Sample: QC for batch 1271488	Client: ARSL001	Project: QC
Client ID: CAWA-13-24552PS	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1271488	Inst: VOA9.I	Dilution: 1
Run Date: 12/19/2012 16:23	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 12/19/2012 16:23		
Data File: 121912V9\9R320.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane		44.4	ug/L	0.300	1.00
74-87-3	Chloromethane		48.8	ug/L	0.300	1.00
75-01-4	Vinyl chloride		39.8	ug/L	0.300	1.00
74-83-9	Bromomethane		49.1	ug/L	0.300	1.00
75-00-3	Chloroethane		47.5	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.3	ug/L	0.300	1.00
60-29-7	Ethyl ether		45.3	ug/L	0.300	1.00
67-64-1	Acetone		119	ug/L	3.00	10.0
75-05-8	Acetonitrile		1110	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene		47.3	ug/L	0.300	1.00
74-88-4	Iodomethane		204	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.0	ug/L	3.00	10.0
75-15-0	Carbon disulfide		261	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether		46.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		46.4	ug/L	0.300	1.00
108-05-4	Vinyl acetate		232	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane		47.4	ug/L	0.300	1.00
78-93-3	2-Butanone		158	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene		46.1	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.7	ug/L	0.300	1.00
67-66-3	Chloroform		47.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		44.0	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.6	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol		5340	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride		49.8	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.5	ug/L	0.300	1.00
71-43-2	Benzene		45.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		47.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		45.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		224	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene		50.9	ug/L	0.300	1.00
108-88-3	Toluene		46.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		51.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		178	ug/L	2.20	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2013-409	Date Collected:	12/13/2012 15:33	Matrix:	W
Lab Sample ID:	1202801061	Date Received:	12/18/2012 09:55		
Client Sample:	QC for batch 1271488	Client:	ARSL001	Project:	QC
Client ID:	CAWA-13-24552PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1271488	Inst:	VOA9.I	Dilution:	1
Run Date:	12/19/2012 16:23	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	12/19/2012 16:23				
Data File:	121912V9\9R320.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane		46.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		43.6	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.1	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane		47.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		45.4	ug/L	0.300	1.00
100-41-4	Ethylbenzene		45.5	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		92.5	ug/L	0.300	2.00
95-47-6	o-Xylene		45.2	ug/L	0.300	1.00
100-42-5	Styrene		47.1	ug/L	0.300	1.00
75-25-2	Bromoform		52.3	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		45.8	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.6	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		44.3	ug/L	0.300	1.00
98-82-8	Isopropylbenzene		46.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.2	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene		46.5	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		46.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		44.2	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		43.6	ug/L	0.300	1.00
104-51-8	n-Butylbenzene		47.0	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		51.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		46.0	ug/L	0.300	1.00
91-20-3	Naphthalene		45.8	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene		43.8	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2013-409	Date Collected:	12/13/2012 15:33	Matrix:	W
Lab Sample ID:	1202801061	Date Received:	12/18/2012 09:55		
Client Sample:	QC for batch 1271488	Client:	ARSL001	Project:	QC
Client ID:	CAWA-13-24552PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1271488	Inst:	VOA9.I	Dilution:	1
Run Date:	12/19/2012 16:23	Analyst:	RXY1	Purge Vol:	5 mL
Prep Date:	12/19/2012 16:23				
Data File:	121912V9\9R320.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane		49.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		43.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		44.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.7	50.0	ug/L 103	(78%-124%)
Bromofluorobenzene	50.5	50.0	ug/L 101	(80%-120%)
Toluene-d8	50.7	50.0	ug/L 101	(80%-120%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409	Date Collected: 12/13/2012 15:33	Matrix: W
Lab Sample ID: 1202801062	Date Received: 12/18/2012 09:55	
Client Sample: QC for batch 1271488	Client: ARSL001	Project: QC
Client ID: CAWA-13-24552PSD	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1271488	Inst: VOA9.I	Dilution: 1
Run Date: 12/19/2012 16:50	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 12/19/2012 16:50		
Data File: 121912V9\9R321.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane		45.8	ug/L	0.300	1.00
74-87-3	Chloromethane		50.8	ug/L	0.300	1.00
75-01-4	Vinyl chloride		43.8	ug/L	0.300	1.00
74-83-9	Bromomethane		49.0	ug/L	0.300	1.00
75-00-3	Chloroethane		47.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.5	ug/L	0.300	1.00
67-64-1	Acetone		135	ug/L	3.00	10.0
75-05-8	Acetonitrile		1230	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene		47.4	ug/L	0.300	1.00
74-88-4	Iodomethane		210	ug/L	1.50	5.00
75-09-2	Methylene chloride		47.4	ug/L	3.00	10.0
75-15-0	Carbon disulfide		257	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether		49.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		46.9	ug/L	0.300	1.00
108-05-4	Vinyl acetate		247	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane		47.3	ug/L	0.300	1.00
78-93-3	2-Butanone		181	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene		46.6	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		48.1	ug/L	0.300	1.00
67-66-3	Chloroform		47.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		46.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.9	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol		6110	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride		50.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		49.2	ug/L	0.300	1.00
71-43-2	Benzene		45.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.2	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.3	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		248	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene		51.3	ug/L	0.300	1.00
108-88-3	Toluene		45.3	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		52.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		200	ug/L	2.20	5.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409	Date Collected: 12/13/2012 15:33	Matrix: W
Lab Sample ID: 1202801062	Date Received: 12/18/2012 09:55	
Client Sample: QC for batch 1271488	Client: ARSL001	Project: QC
Client ID: CAWA-13-24552PSD	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1271488	Inst: VOA9.I	Dilution: 1
Run Date: 12/19/2012 16:50	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 12/19/2012 16:50		
Data File: 121912V9\9R321.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane		48.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.2	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane		49.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		45.8	ug/L	0.300	1.00
100-41-4	Ethylbenzene		45.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		92.4	ug/L	0.300	2.00
95-47-6	o-Xylene		44.8	ug/L	0.300	1.00
100-42-5	Styrene		46.6	ug/L	0.300	1.00
75-25-2	Bromoform		56.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		44.2	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		44.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		44.6	ug/L	0.300	1.00
98-82-8	Isopropylbenzene		45.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		45.3	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene		45.5	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.5	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		45.8	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		46.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		44.6	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		43.6	ug/L	0.300	1.00
104-51-8	n-Butylbenzene		46.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		62.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		46.4	ug/L	0.300	1.00
91-20-3	Naphthalene		50.1	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene		45.4	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409	Date Collected: 12/13/2012 15:33	Matrix: W
Lab Sample ID: 1202801062	Date Received: 12/18/2012 09:55	
Client Sample: QC for batch 1271488	Client: ARSL001	Project: QC
Client ID: CAWA-13-24552PSD	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1271488	Inst: VOA9.I	Dilution: 1
Run Date: 12/19/2012 16:50	Analyst: RXY1	Purge Vol: 5 mL
Prep Date: 12/19/2012 16:50		
Data File: 121912V9\9R321.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane		49.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.7	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.2	50.0	104	(78%-124%)
Bromofluorobenzene	50.2	50.0	100	(80%-120%)
Toluene-d8	49.4	50.0	98.8	(80%-120%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409	Matrix: WATER
Lab Sample ID: 1202801063	
Client Sample: QC for batch 1271488	Client: ARSL001
Client ID: LCS for batch 1271488	Method: SW846 8260B DOE-AL
Batch ID: 1271488	Project: QC
Run Date: 12/19/2012 08:34	SOP Ref: GL-OA-E-038
Prep Date: 12/19/2012 08:34	Dilution: 1
Data File: 121912V9\9R303L.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane		46.5	ug/L	0.300	1.00
74-87-3	Chloromethane		52.7	ug/L	0.300	1.00
75-01-4	Vinyl chloride		47.9	ug/L	0.300	1.00
74-83-9	Bromomethane		49.6	ug/L	0.300	1.00
75-00-3	Chloroethane		50.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		48.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.9	ug/L	0.300	1.00
67-64-1	Acetone		253	ug/L	3.00	10.0
75-05-8	Acetonitrile		1180	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene		49.8	ug/L	0.300	1.00
74-88-4	Iodomethane		227	ug/L	1.50	5.00
75-09-2	Methylene chloride		47.3	ug/L	3.00	10.0
75-15-0	Carbon disulfide		270	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether		49.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.5	ug/L	0.300	1.00
108-05-4	Vinyl acetate		258	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane		48.3	ug/L	0.300	1.00
78-93-3	2-Butanone		284	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene		48.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		53.1	ug/L	0.300	1.00
67-66-3	Chloroform		47.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		47.8	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		51.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.1	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol		5650	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride		53.9	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.7	ug/L	0.300	1.00
71-43-2	Benzene		47.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		50.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		256	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene		51.5	ug/L	0.300	1.00
108-88-3	Toluene		46.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		51.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		46.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		287	ug/L	2.20	5.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2013-409	Matrix: WATER
Lab Sample ID: 1202801063	
Client Sample: QC for batch 1271488	Client: ARSL001
Client ID: LCS for batch 1271488	Method: SW846 8260B DOE-AL
Batch ID: 1271488	Project: QC
Run Date: 12/19/2012 08:34	SOP Ref: GL-OA-E-038
Prep Date: 12/19/2012 08:34	Dilution: 1
Data File: 121912V9\9R303L.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane		45.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.1	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane		48.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.2	ug/L	0.300	1.00
100-41-4	Ethylbenzene		46.4	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		96.4	ug/L	0.300	2.00
95-47-6	o-Xylene		46.7	ug/L	0.300	1.00
100-42-5	Styrene		48.8	ug/L	0.300	1.00
75-25-2	Bromoform		55.6	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		48.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.2	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		46.8	ug/L	0.300	1.00
98-82-8	Isopropylbenzene		47.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.0	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene		47.4	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		49.2	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.3	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.9	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		47.2	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.2	ug/L	0.300	1.00
104-51-8	n-Butylbenzene		48.8	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		58.0	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		49.8	ug/L	0.300	1.00
91-20-3	Naphthalene		49.2	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene		47.9	ug/L	0.300	1.00
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2013-409	Matrix:	WATER
Lab Sample ID:	1202801063		
Client Sample:	QC for batch 1271488	Client:	ARSL001
Client ID:	LCS for batch 1271488	Method:	SW846 8260B DOE-AL
Batch ID:	1271488	Inst:	VOA9.I
Run Date:	12/19/2012 08:34	Analyst:	RXY1
Prep Date:	12/19/2012 08:34	Purge Vol:	5 mL
Data File:	121912V9\9R303L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane		51.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		49.2	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		46.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.1	50.0	ug/L 100	(78%-124%)
Bromofluorobenzene	47.7	50.0	ug/L 95.5	(80%-120%)
Toluene-d8	47.6	50.0	ug/L 95.3	(80%-120%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2013-409

Matrix: WATER

Lab Sample ID: 1202801064

Client Sample: QC for batch 1271488

Client: ARSL001

Project: QC

Client ID: LCS for batch 1271488

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1271488

Inst: VOA9.I

Dilution: 1

Run Date: 12/19/2012 09:29

Analyst: RXY1

Purge Vol: 5 mL

Prep Date: 12/19/2012 09:29

Data File: 121912V9\9R305LD

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
67-64-1	Acetone	U	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	3.00	10.0
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	2.00	5.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	2.20	5.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2013-409	Matrix: WATER
Lab Sample ID: 1202801064	
Client Sample: QC for batch 1271488	Client: ARSL001
Client ID: LCS for batch 1271488	Method: SW846 8260B DOE-AL
Batch ID: 1271488	Project: QC
Run Date: 12/19/2012 09:29	SOP Ref: GL-OA-E-038
Prep Date: 12/19/2012 09:29	Dilution: 1
Data File: 121912V9\9R305L.D	Purge Vol: 5 mL
	Analyst: RXY1
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
91-20-3	Naphthalene	U	1.00	ug/L	0.400	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
107-02-8	Acrolein		218	ug/L	1.50	5.00
76-13-1	Trichlorotrifluoroethane		248	ug/L	1.50	5.00
107-05-1	Allyl chloride		220	ug/L	1.50	5.00
107-13-1	Acrylonitrile		214	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		50.1	ug/L	0.300	1.00
107-12-0	Propionitrile		219	ug/L	1.50	5.00
126-98-7	Methacrylonitrile		217	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2210	ug/L	15.0	50.0
80-62-6	Methyl methacrylate		210	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2013-409	Matrix:	WATER
Lab Sample ID:	1202801064		
Client Sample:	QC for batch 1271488	Client:	ARSL001
Client ID:	LCS for batch 1271488	Method:	SW846 8260B DOE-AL
Batch ID:	1271488	Inst:	VOA9.I
Run Date:	12/19/2012 09:29	Analyst:	RXY1
Prep Date:	12/19/2012 09:29	Purge Vol:	5 mL
Data File:	121912V9\9R305L.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
97-63-2	Ethyl methacrylate		220	ug/L	1.50	5.00
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.3	50.0	96.5	(78%-124%)
Bromofluorobenzene	47.8	50.0	95.6	(80%-120%)
Toluene-d8	48.9	50.0	97.7	(80%-120%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC/MSMS
ARS International (ARSL)
SDG 2013-409**

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: 1270699

Prep Batch Number: 1270697

Sample Analysis

Sample ID	Client ID
316677002	CALA-13-24550
1202799066	Interference Check Sample (ICS)
1202799059	Method Blank (MB)
1202799060	Laboratory Control Sample (LCS)
1202799061	316547002(CALA-13-24548) Matrix Spike (MS)
1202799062	316547002(CALA-13-24548) 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# 9.

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 316547002 (CALA-13-24548) from SDG 2013-390 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

Sample 316677002 (CALA-13-24550) was diluted to bring the over range concentration within the calibration range.

Parmname **316677**
 002
All 10X

Sample Re-extraction/Re-analysis

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

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 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: 2013-409 GEL Work Order: 316677

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 19 DEC 2012

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-13-24550Date Received: 13-DEC-12GEL Job No (SDG): 2013-409GEL Sample ID: 316677002Date Filtered: 17-DEC-12Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	5.38	ug/L		10	17-DEC-12 16:08	per1217029a
	Perchlorate Isotope Ratio			3.16			10	17-DEC-12 16:08	per1217029a
14797-73-0	Perchlorate-101	.5	2	5.45	ug/L		10	17-DEC-12 16:08	per1217029a
	Perchlorate-O(18)			5.08	ug/L		10	17-DEC-12 16:08	per1217029a

^ 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): 2013-409

Extract Batch Code: 1270697

Date Filtered: 17-DEC-12

Matrix: WATER

Sample ID: 1202799060

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.2	ug/L	99.9		85 - 115
Perchlorate Isotope Ratio		3.18				-
Perchlorate-101	0.200	.201	ug/L	101		85 - 115
Perchlorate-O(18)		.485	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): 2013-409

Extract Batch Code: 1270697

Date Extracted: 17-DEC-12

GEL MS/PS ID: 1202799061

Client ID: CALA-13-24548

GEL MSD/PSD ID: 1202799062

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	0.486	ug/L	0.690	102	.677	95.1	1.98	30	75 - 125
Perchlorate Isotope Ratio	0	3.15		3.14		3.12		.546		-
Perchlorate-101	0.200	0.495	ug/L	0.705	105	.695	99.8	1.43	30	75 - 125
Perchlorate-O(18)	0	0.489	ug/L	0.515		.507		1.4		-

^ 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: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 17-DEC-12GEL Job No (SDG): 2013-409GEL Sample ID: 1202799059Date Filtered: 17-DEC-12Injection 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	0.050	ug/L	U	1	17-DEC-12 13:52	per1217012a
	Perchlorate Isotope Ratio						1	17-DEC-12 13:52	per1217012a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	17-DEC-12 13:52	per1217012a
	Perchlorate-O(18)			0.489	ug/L		1	17-DEC-12 13:52	per1217012a

^ 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: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 17-DEC-12GEL Job No (SDG): 2013-409GEL Sample ID: 1202799060Date Filtered: 17-DEC-12Injection 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	J	1	17-DEC-12 14:00	per1217013a
	Perchlorate Isotope Ratio			3.18			1	17-DEC-12 14:00	per1217013a
14797-73-0	Perchlorate-101	.05	.2	0.201	ug/L		1	17-DEC-12 14:00	per1217013a
	Perchlorate-O(18)			0.485	ug/L		1	17-DEC-12 14:00	per1217013a

^ 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: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-409GEL Sample ID: 1202799066Date Filtered: 17-DEC-12Injection 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	0.211	ug/L		1	17-DEC-12 14:08	per1217014a
	Perchlorate Isotope Ratio			3.1			1	17-DEC-12 14:08	per1217014a
14797-73-0	Perchlorate-101	.05	.2	0.218	ug/L		1	17-DEC-12 14:08	per1217014a
	Perchlorate-O(18)			0.517	ug/L		1	17-DEC-12 14:08	per1217014a

^ 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: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-13-24548MSDate Received: 11-DEC-12GEL Job No (SDG): 2013-409GEL Sample ID: 1202799061Date Filtered: 17-DEC-12Injection 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	0.690	ug/L		1	17-DEC-12 14:24	per1217016a
	Perchlorate Isotope Ratio			3.14			1	17-DEC-12 14:24	per1217016a
14797-73-0	Perchlorate-101	.05	.2	0.705	ug/L		1	17-DEC-12 14:24	per1217016a
	Perchlorate-O(18)			0.515	ug/L		1	17-DEC-12 14:24	per1217016a

^ 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: 1270697Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-13-24548MSDDate Received: 11-DEC-12GEL Job No (SDG): 2013-409GEL Sample ID: 1202799062Date Filtered: 17-DEC-12Injection 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	0.677	ug/L		1	17-DEC-12 14:32	per1217017a
	Perchlorate Isotope Ratio			3.12			1	17-DEC-12 14:32	per1217017a
14797-73-0	Perchlorate-101	.05	.2	0.695	ug/L		1	17-DEC-12 14:32	per1217017a
	Perchlorate-O(18)			0.507	ug/L		1	17-DEC-12 14:32	per1217017a

^ 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 2013-409**

Sample Analysis

Sample ID	Client ID
316677002	CALA-13-24550
1202798221	Method Blank (MB) ICP
1202798222	Laboratory Control Sample (LCS)
1202798225	316677002(CALA-13-24550L) Serial Dilution (SD)
1202798223	316677002(CALA-13-24550D) Sample Duplicate (DUP)
1202798224	316677002(CALA-13-24550S) Matrix Spike (MS)
1202798743	Method Blank (MB) ICP-MS
1202798744	Laboratory Control Sample (LCS)
1202798747	316677002(CALA-13-24550L) Serial Dilution (SD)
1202798745	316677002(CALA-13-24550D) Sample Duplicate (DUP)
1202798746	316677002(CALA-13-24550S) Matrix Spike (MS)
1202799643	Method Blank (MB) CVAA
1202799644	Laboratory Control Sample (LCS)
1202799647	316677002(CALA-13-24550L) Serial Dilution (SD)
1202799645	316677002(CALA-13-24550D) Sample Duplicate (DUP)
1202799646	316677002(CALA-13-24550S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1270441, 1270573, 1270929 and 1273257
Prep Batch :	1270440, 1270572 and 1270926
Standard Operating Procedures:	GL-MA-E-013 REV# 21, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 24, GL-MA-E-010 REV# 25 and GL-GC-E-107 REV# 8
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL Requirements

All CRDL standards met the advisory control limits with the exception of potassium. The PQL recovery was not within the control limits of 70%-130% for potassium.

ICSA/ICSAB Statement

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

Continuing Calibration Blank (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 316677002 (CALA-13-24550)-ICP, ICP-MS and 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 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: Nick-Cole A. Elmore Date: 01.09.13

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: 2013-409 GEL Work Order: 316677

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

J Value is estimated

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

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 detection limit.

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

 01-09-13

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-409 CONTRACT: ESHL00210 METHOD TYPE: EPA

SAMPLE ID: 316677002 BASIS: As Received DATE COLLECTED 12-DEC-12
CLIENT ID: CALA-13-24550 LEVEL: Low DATE RECEIVED 13-DEC-12
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	0.079	ug/L	J	0.067	0.2	0.2	1	AV	BYV1	12/18/12 13:30	121812W1-4	1270929

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-409

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 316677002

BASIS: As Received

DATE COLLECTED 12-DEC-12

CLIENT ID: CALA-13-24550

LEVEL: Low

DATE RECEIVED 13-DEC-12

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	12/19/12 11:54	121912A-1	1270441
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-39-3	Barium	49.9	ug/L		1	5	5	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-42-8	Boron	37.9	ug/L	J	15	50	50	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-70-2	Calcium	30400	ug/L		50	200	200	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-47-3	Chromium	4.6	ug/L	J	2	10	10	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7439-95-4	Magnesium	8470	ug/L		110	300	300	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7439-98-7	Molybdenum	2.47	ug/L		0.165	0.5	0.5	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-02-0	Nickel	1.64	ug/L	J	0.5	2	2	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-09-7	Potassium	5230	ug/L		50	150	150	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7782-49-2	Selenium	1.72	ug/L	J	1.5	5	5	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7631-86-9	Silica	46900	ug/L		53	213	213	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-23-5	Sodium	18200	ug/L		100	300	300	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-24-6	Strontium	147	ug/L		1	5	5	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	12/21/12 15:23	121221-2	1270573
7440-31-5	Tin	50	ug/L	U	12.5	50	50	5	P	HSC	12/19/12 12:40	121912A-1	1270441
7440-61-1	Uranium	2.16	ug/L		0.067	0.2	0.2	1	MS	BAJ	12/24/12 12:19	121224-3	1270573
7440-62-2	Vanadium	8.4	ug/L		1	5	5	1	P	HSC	12/19/12 11:54	121912A-1	1270441
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	12/19/12 11:54	121912A-1	1270441

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-409

CONTRACT: ESHL00210

METHOD TYPE:

SAMPLE ID: 316677002

BASIS: As Received

DATE COLLECTED 12-DEC-12

CLIENT ID: CALA-13-24550

LEVEL: Low

DATE RECEIVED 13-DEC-12

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	111	mg/L		0.453	1.24	1.24	1		JJ2	01/02/13 08:56		1273257

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1270441	1270440	SW846 3005A	50	mL	50	mL	12/17/12	BXA1
1270573	1270572	SW846 3005A	50	mL	50	mL	12/14/12	BXA1
1270929	1270926	EPA 245.1/245.2 Prep	20	mL	20	mL	12/17/12	AXS5

*Analytical Methods:

MS

SW846 3005/6020 DOE-AL

P

SW846 3005/6010B

AV

EPA 245.1/245.2

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2013-409
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>
1202798221	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Calcium	50	ug/L	+/-200	U	P	50	200
	Boron	15	ug/L	+/-50	U	P	15	50
	Copper	3	ug/L	+/-10	U	P	3	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Potassium	70.2	ug/L	+/-200	J	P	50	200
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Sodium	100	ug/L	+/-300	U	P	100	300
	Silica	53	ug/L	+/-213	U	P	53	213
	Manganese	2	ug/L	+/-10	U	P	2	10
	Iron	30	ug/L	+/-100	U	P	30	100
1202798743	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
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Chromium	2.35	ug/L	+/-10	J	MS	2	10
	Molybdenum	0.169	ug/L	+/-0.5	J	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
1202799643	Mercury	0.067	ug/L	+/-0.5	U	AV	0.067	0.5

***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. 2013-409

Client ID: CALA-13-24550S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 316677002

Spike ID: 1202798224

<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	5170		68	U	5000	103		P
Barium	ug/L	75-125	561		49.9		500	102		P
Beryllium	ug/L	75-125	523		1	U	500	105		P
Boron	ug/L	75-125	566		37.9	J	500	106		P
Calcium	ug/L		35000		30400		5000	91.8	N/A	P
Cobalt	ug/L	75-125	507		1	U	500	101		P
Copper	ug/L	75-125	524		3	U	500	105		P
Iron	ug/L	75-125	5250		30	U	5000	105		P
Magnesium	ug/L	75-125	13500		8470		5000	102		P
Manganese	ug/L	75-125	512		2	U	500	102		P
Potassium	ug/L	75-125	10100		5230		5000	98.3		P
Silica	ug/L		57400		46900		10700	97.8	N/A	P
Sodium	ug/L	75-125	23300		18200		5000	102		P
Strontium	ug/L	75-125	650		147		500	101		P
Tin	ug/L	75-125	515		12.5	U	500	103		P
Vanadium	ug/L	75-125	532		8.4		500	105		P
Zinc	ug/L	75-125	509		3.3	U	500	102		P

*Analytical Methods:

P SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-409

Client ID: CALA-13-24550S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 316677002

Spike ID: 1202798746

<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	199		1	U	200	99.5		MS
Arsenic	ug/L	75-125	79.7		1.7	U	80	99.1		MS
Cadmium	ug/L	75-125	10.5		0.11	U	10	105		MS
Chromium	ug/L	75-125	52.8		4.6	J	50	96.3		MS
Lead	ug/L	75-125	39.9		0.5	U	40	99.8		MS
Molybdenum	ug/L	75-125	51.7		2.47		50	98.5		MS
Nickel	ug/L	75-125	49.3		1.64	J	50	95.3		MS
Selenium	ug/L	75-125	22.7		1.72	J	20	105		MS
Silver	ug/L	75-125	49.5		0.2	U	50	98.9		MS
Thallium	ug/L	75-125	89.5		0.45	U	100	89.5		MS
Uranium	ug/L	75-125	63.3		2.16		50	122		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-409

Client ID: CALA-13-24550S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 316677002

Spike ID: 1202799646

<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	2.09		0.079	J	2	101		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2013-409

Lab Code: GEL

Contract: ESHL00210

Client ID: CALA-13-24550D

Matrix: LIQUID

Level: Low

Sample ID: 316677002

Duplicate ID: 1202798223

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-20%	49.9		48.1		3.81		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	37.9 J		36.6 J		3.34		P
Calcium	ug/L	+/-20%	30400		29200		4.19		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	8470		8130		4.04		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	5230		5020		4.1		P
Silica	ug/L	+/-20%	46900		44900		4.27		P
Sodium	ug/L	+/-20%	18200		17600		3.42		P
Strontium	ug/L	+/-20%	147		141		3.75		P
Tin	ug/L		12.5 U		12.5 U				P
Vanadium	ug/L	+/-5	8.4		7.37		13.1		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005/6010B

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–409

Lab Code: GEL

Contract: ESHL00210

Client ID: CALA–13–24550D

Matrix: LIQUID

Level: Low

Sample ID: 316677002

Duplicate ID: 1202798745

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		1.7 U		1.7 U				MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L	+/-10	4.6 J		3.52 J		26.6		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	2.47		2.33		5.92		MS
Nickel	ug/L	+/-2	1.64 J		1.56 J		4.69		MS
Selenium	ug/L	+/-5	1.72 J		1.55 J		10.5		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%	2.16		2		7.99		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

Metals
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Duplicate Sample Summary

SDG No.: 2013–409**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CALA–13–24550D**Matrix:** LIQUID**Level:** Low**Sample ID:** 316677002**Duplicate ID:** 1202799645**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Mercury	ug/L	+/- .2	0.079 J		0.093 J		16.3		AV

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-409

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>
1202798222								
	Silica	ug/L	10700	10800		101	80-120	P
	Sodium	ug/L	5000	5080		102	80-120	P
	Strontium	ug/L	500	504		101	80-120	P
	Tin	ug/L	500	512		102	80-120	P
	Vanadium	ug/L	500	508		102	80-120	P
	Zinc	ug/L	500	497		99.4	80-120	P
	Aluminum	ug/L	5000	5140		103	80-120	P
	Barium	ug/L	500	506		101	80-120	P
	Beryllium	ug/L	500	508		102	80-120	P
	Boron	ug/L	500	509		102	80-120	P
	Calcium	ug/L	5000	5200		104	80-120	P
	Cobalt	ug/L	500	508		102	80-120	P
	Copper	ug/L	500	504		101	80-120	P
	Iron	ug/L	5000	5180		104	80-120	P
	Magnesium	ug/L	5000	5300		106	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5030		101	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-409

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>
1202798744								
	Antimony	ug/L	50	49.4		98.7	80-120	MS
	Arsenic	ug/L	50	48.6		97.2	80-120	MS
	Cadmium	ug/L	50	50.4		101	80-120	MS
	Chromium	ug/L	50	47.3		94.6	80-120	MS
	Lead	ug/L	50	50.5		101	80-120	MS
	Molybdenum	ug/L	50	48.2		96.4	80-120	MS
	Nickel	ug/L	50	50.2		100	80-120	MS
	Selenium	ug/L	50	53.2		106	80-120	MS
	Silver	ug/L	50	51.3		103	80-120	MS
	Thallium	ug/L	50	47.3		94.7	80-120	MS
	Uranium	ug/L	50	58.7		117	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-409

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>
1202799644	Mercury	ug/L	2	2.13		107	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2013-409

Client ID: CALA-13-24550L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 316677002

Serial Dilution ID: 1202798225

<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	49.9		50.8		1.71			P
Beryllium	1	U	5	U				P
Boron	37.9	J	75	U	100			P
Calcium	30400		30400		.089		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	8470		8790		3.8		10	P
Manganese	2	U	10	U				P
Potassium	5230		5650		8.09		10	P
Silica	46900		46400		1.17		10	P
Sodium	18200		19000		4.4		10	P
Strontium	147		147		.478		10	P
Tin	2.5	U	12.5	U				P
Vanadium	8.4		6.36	J	24.3			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005/6010B

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-409

Client ID: CALA-13-24550L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 316677002

Serial Dilution ID: 1202798747

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	1.7	U	8.5	U				MS
Cadmium	.11	U	.55	U				MS
Chromium	4.6	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.47		2.5	J	1.05			MS
Nickel	1.64	J	2.5	U	100			MS
Selenium	1.72	J	7.5	U	100			MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	2.16		2.19		1.11			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-409 **Client ID:** CALA-13-24550L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 316677002 **Serial Dilution ID:** 1202799647

<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	.079	J	.335	U	100			AV

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 2013-409**

Method/Analysis Information

Product: Carbon, Total Organic

Analytical Batch: 1270524

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
316677001	CALA-13-24549
1202798556	Method Blank (MB)
1202798557	316547001(CALA-13-24546) Sample Duplicate (DUP)
1202798558	316547001(CALA-13-24546) Post Spike (PS)
1202798559	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# 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 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: 316547001 (CALA-13-24546).

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: 1271097

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
316677002	CALA-13-24550
1202800143	316547002(CALA-13-24548) Sample Duplicate (DUP)
1202800144	316563002(CALA-13-24547) Sample Duplicate (DUP)
1202800145	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.

Calibration Verification Information

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

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: 316547002 (CALA-13-24548) and 316563002 (CALA-13-24547).

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: 1270434 **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
316677002	CALA-13-24550
1202798141	316563002(CALA-13-24547) Sample Duplicate (DUP)
1202798143	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: 316563002 (CALA-13-24547).

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: 316677002 (CALA-13-24550).

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: 1149003 316677002 (CALA-13-24550).

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: 1270140

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
316677002	CALA-13-24550
1202797071	Method Blank (MB)
1202797072	316547002(CALA-13-24548) Sample Duplicate (DUP)
1202797073	316547002(CALA-13-24548) Post Spike (PS)
1202797074	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# 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 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: 316547002 (CALA-13-24548).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202797072 (CALA-13-24548), 1202797073 (CALA-13-24548) and 316677002 (CALA-13-24550).

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: 1270247 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1270246 **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
316677002	CALA-13-24550
1202797520	Method Blank (MB)
1202797521	Laboratory Control Sample (LCS)
1202797522	316677002(CALA-13-24550) Sample Duplicate (DUP)
1202797523	316677002(CALA-13-24550) 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# 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+ 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: 316677002 (CALA-13-24550).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202797523 (CALA-13-24550).

Duplicate Relative Percent Difference (RPD) Statement

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202797522 (CALA-13-24550).

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The following samples were re-analyzed due to CCV failure: 1202797520 (MB), 1202797521 (LCS) and 316677002 (CALA-13-24550).

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

The following DER was generated for this SDG: 1150631 1202797523 (CALA-13-24550).

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:	1270973	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1270970	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
316677001	CALA-13-24549
1202799787	Method Blank (MB)
1202799788	316563001(CALA-13-24545) Sample Duplicate (DUP)
1202799790	316563001(CALA-13-24545) Matrix Spike (MS)
1202799792	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-104 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 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 sample was selected for QC analysis: 316563001 (CALA-13-24545).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202799790 (CALA-13-24545).

Duplicate Relative Percent Difference (RPD) Statement

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202799788 (CALA-13-24545).

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

The following DER was generated for this SDG: 1152221 1202799790 (CALA-13-24545).

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:	1270939	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
316677002	CALA-13-24550
1202799681	Method Blank (MB)
1202799682	Laboratory Control Sample (LCS)
1202799685	316677002(CALA-13-24550) Sample Duplicate (DUP)
1202799731	316677002(CALA-13-24550) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

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

Calibration Information

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

Calibration Verification Information

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

Continuing Calibration Blanks

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

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: 316677002 (CALA-13-24550).

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: 1202799685 (CALA-13-24550), 1202799731 (CALA-13-24550) and 316677002 (CALA-13-24550).

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:	1270237	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1270236	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
316677002	CALA-13-24550
1202797494	Method Blank (MB)
1202797495	Laboratory Control Sample (LCS)
1202797496	316677002(CALA-13-24550) Sample Duplicate (DUP)
1202797497	316677002(CALA-13-24550) 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# 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.

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: 316677002 (CALA-13-24550).

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

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, Total Dissolved

Analytical Batch: 1270543

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
316677002	CALA-13-24550
1202798631	Method Blank (MB)
1202798632	316723001(Buckman01-12-24575) Sample Duplicate (DUP)
1202798635	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: 316723001 (Buckman01-12-24575).

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 Re-analysis

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

Sample Aliquot

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1270639 **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
316677002	CALA-13-24550
1202798934	Laboratory Control Sample (LCS)
1202798935	316547002(CALA-13-24548) Sample Duplicate (DUP)
1202798936	316547002(CALA-13-24548) Matrix Spike (MS)
1202798937	Method Blank (MB)

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

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: 316547002 (CALA-13-24548).

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 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

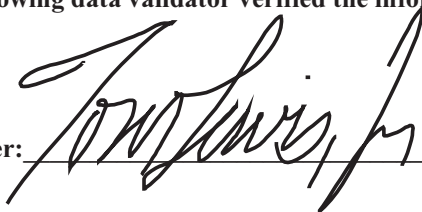
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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:

09Jan13

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-409 GEL Work Order: 316677

The Qualifiers in this report are defined as follows:

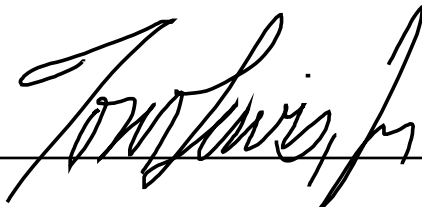
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 detection limit.

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

Reviewed by

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 9, 2013

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

Client SDG: 2013-409

Client Sample ID: CALA-13-24549
Sample ID: 316677001
Matrix: W
Collect Date: 12-DEC-12 09:45
Receive Date: 13-DEC-12
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.777	0.330	1.00	mg/L	1	TSM	12/20/12	0055	1270524	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	12/27/12	1326	1270973	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	12/26/12	1700	1270970

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

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Certificate of Analysis

Report Date: January 9, 2013

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

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-409

Client Sample ID: CALA-13-24550
Sample ID: 316677002
Matrix: W
Collect Date: 12-DEC-12 09:45
Receive Date: 13-DEC-12
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		311	1.00	1.00	umhos/cm	1	TXT1	12/19/12	1626	1271097	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 17.5C	H	7.44	0.010	0.100	SU	1	TXT1	12/13/12	1555	1270434	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.146	0.067	0.200	mg/L	1	VH1	12/18/12	2312	1270140	3
Chloride		18.9	0.067	0.200	mg/L	1					
Fluoride		0.467	0.033	0.100	mg/L	1					
Sulfate		21.4	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia	J	0.0476	0.017	0.050	mg/L	1	KLP1	12/19/12	1509	1270247	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		3.78	0.170	0.500	mg/L	10	AXH3	12/18/12	1123	1270939	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		0.259	0.017	0.050	mg/L	1	KLP1	12/18/12	1110	1270237	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		197	3.40	14.3	mg/L		LYG1	12/14/12	0724	1270543	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		86.5	0.725	1.00	mg/L		LXA1	12/14/12	1440	1270639	8
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	12/19/12	1330	1270246
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/17/12	1500	1270236

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Certificate of Analysis

Report Date: January 9, 2013

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

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-409

Client Sample ID: CALA-13-24550
Sample ID: 316677002

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:											
Method	Description					Analyst Comments					
1	EPA 120.1										
2	EPA 150.1										
3	EPA 300.0										
4	EPA 350.1										
5	EPA 353.2										
6	EPA 365.4										
7	EPA 160.1										
8	EPA 310.1										

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: January 9, 2013

Page 1 of 4

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

Contact: Keith Greene

Workorder: 316677

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1270524										
QC1202798557	316547001	DUP									
Total Organic Carbon Average	J	0.349	U	ND	mg/L	N/A	^		TSM	12/19/12	22:28
QC1202798559	LCS										
Total Organic Carbon Average	10.0			9.84	mg/L		98.4	(85%-115%)		12/19/12	21:46
QC1202798556	MB										
Total Organic Carbon Average			U	ND	mg/L					12/19/12	21:37
QC1202798558	316547001	PS									
Total Organic Carbon Average	10.0	J	0.349	9.48	mg/L		91.3	(65%-120%)		12/19/12	22:48
Conductivity Analysis											
Batch	1271097										
QC1202800143	316547002	DUP									
Conductivity			190	190	umhos/cm	0.105		(0%-10%)	TXT1	12/19/12	15:52
QC1202800144	316563002	DUP									
Conductivity			122	126	umhos/cm	3.23		(0%-10%)		12/19/12	16:15
QC1202800145	LCS										
Conductivity	1410			1420	umhos/cm		100	(95%-105%)		12/19/12	15:37
Electrode Analysis											
Batch	1270434										
QC1202798141	316563002	DUP									
pH	H	8.00	H	8.05	SU	0.623		(0%-10%)	TXT1	12/13/12	14:53
QC1202798143	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		12/13/12	14:47
Ion Chromatography											
Batch	1270140										
QC1202797072	316547002	DUP									
Bromide	U	ND	U	ND	mg/L	N/A			VH1	12/18/12	20:37
Chloride		3.23		3.23	mg/L	0.0836		(0%-20%)			
Fluoride		0.299		0.307	mg/L	2.67	^	(+/-0.100)			
Sulfate		3.40		3.30	mg/L	2.88		(0%-20%)			
QC1202797074	LCS										
Bromide	2.50			2.65	mg/L		106	(90%-110%)		12/18/12	19:35
Chloride	10.0			9.76	mg/L		97.6	(90%-110%)			
Fluoride	5.00			5.38	mg/L		108	(90%-110%)			
Sulfate	20.0			20.2	mg/L		101	(90%-110%)			
QC1202797071	MB										
Bromide			U	ND	mg/L					12/18/12	19:04
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202797073	316547002	PS									

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QC Summary

Workorder: 316677

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1270140										
Bromide	2.50	U	ND	2.62	mg/L		105	(90%-110%)		12/18/12	21:08
Chloride	10.0		3.23	13.0	mg/L		97.6	(90%-110%)	VH1		
Fluoride	5.00		0.299	5.26	mg/L		99.2	(90%-110%)			
Sulfate	20.0		3.40	22.4	mg/L		95.1	(90%-110%)			
Nutrient Analysis											
Batch	1270237										
QC1202797496	316677002	DUP									
Phosphorus, Total as P			0.259	0.254	mg/L	1.95		(0%-31%)	KLP1	12/18/12	11:11
QC1202797495	LCS										
Phosphorus, Total as P	1.00			1.06	mg/L		106	(76%-120%)		12/18/12	10:54
QC1202797494	MB										
Phosphorus, Total as P			J	0.0294	mg/L					12/18/12	10:53
QC1202797497	316677002	MS									
Phosphorus, Total as P	1.00		0.259	1.26	mg/L		100	(62%-139%)		12/18/12	11:12
Batch	1270247										
QC1202797522	316677002	DUP									
Nitrogen, Ammonia		J	0.0476	J	0.0209	mg/L	78.0 ^	(+/-0.050)	KLP1	12/19/12	15:13
QC1202797521	LCS										
Nitrogen, Ammonia	1.00			1.08	mg/L		108	(90%-110%)		12/19/12	15:02
QC1202797520	MB										
Nitrogen, Ammonia			U	ND	mg/L					12/19/12	15:01
QC1202797523	316677002	MS									
Nitrogen, Ammonia	1.00	J	0.0476	1.19	mg/L		114 *	(90%-110%)		12/19/12	15:14
Batch	1270939										
QC1202799685	316677002	DUP									
Nitrogen, Nitrate/Nitrite			3.78	3.68	mg/L	2.68		(0%-20%)	AXH3	12/18/12	11:29
QC1202799682	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.02	mg/L		102	(90%-110%)		12/18/12	11:14
QC1202799681	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					12/18/12	11:12
QC1202799731	316677002	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.378	1.41	mg/L		103	(90%-110%)		12/18/12	11:30
Batch	1270973										
QC1202799788	316563001	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	12/27/12	13:24
QC1202799792	LCS										
Nitrogen, Total Kjeldahl	1.00			1.05	mg/L		105	(90%-110%)		12/27/12	13:23
QC1202799787	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					12/27/12	13:22
QC1202799790	316563001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.800	mg/L		80 *	(90%-110%)		12/27/12	13:25
Solids Analysis											
Batch	1270543										
QC1202798632	316723001	DUP									
Total Dissolved Solids			280	274	mg/L	2.06		(0%-10%)	LYG1	12/14/12	07:24
QC1202798635	LCS										

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QC Summary

Workorder: 316677

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1270543										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		12/14/12	07:24
QC1202798631 MB											
Total Dissolved Solids			U	ND	mg/L				LYG1	12/14/12	07:24
Titration Analysis											
Batch	1270639										
QC1202798935 316547002 DUP											
Alkalinity, Total as CaCO3		85.0		84.5	mg/L	0.608		(0%-20%)	LXA1	12/14/12	12:21
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202798934 LCS											
Alkalinity, Total as CaCO3	50.0			50.5	mg/L		101	(90%-110%)		12/14/12	12:04
QC1202798937 MB											
Alkalinity, Total as CaCO3			U	ND	mg/L					12/14/12	12:02
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1202798936 316547002 MS											
Alkalinity, Total as CaCO3	50.0	85.0		135	mg/L		99.9	(80%-120%)		12/14/12	12:28

Notes:

RER is calculated at the 95% confidence level (2-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- E General Chemistry--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
- E Organics--Concentration of the target analyte exceeds the instrument calibration range
- F Estimated Value
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- J Value is estimated
- JNX Non Calibrated Compound
- M Matrix Related Failure
- 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 RPD or %Recovery limits do not apply.
- N1 See case narrative

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QC Summary

Workorder: 316677

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
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										
Y	QC Samples were not spiked with this compound										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
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. 13-DEC-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: BETT, ENRG, ESHL, GELC,
Batch ID: 1270434	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 316563(2013-395),316579,316582,316620,316674,316677(2013-409),316683,316705,316710,316714(2013-396),316723(2013-397),316727(2013-398),316748 Application Issues: Container scanning event for custody missed Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample received out of holding: 316563 002 316579 002,006,010 316582 001,002 316620 001,002,003 316674 001,002 316677 002 316683 001 316705 005 316710 005 316714 001 316723 001 316727 001 316748 001,002 Container scanning event for custody missed: 316748 002		1. Samples were received out of holding. 2. Sample was not scanned to the analytical batch prior to analysis; however, it was in the analyst's custody at the time of analysis.	

Originator's Name:

Travis Tola 13-DEC-12

Data Validator/Group Leader:

Julia Hamilton 20-DEC-12

DATA EXCEPTION REPORT			
Mo.Day Yr. 19-DEC-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 350.1	Matrix Type: Liquid	Client Code: ALBR, DNMI, ECWS, ENRG,
Batch ID: 1270247	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 316521,316524,316547(2013-390),316563(2013-395),316677(2013-409),316705,316710,316714(2013-396),316723(2013-397),316727(2013-398),316750,316760,316770,316821,316889(2013-417),316890 Application Issues: Failed Recovery for MS/PS			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed Recovery for MS: QC 1202797523MS, QC 1202799680MS		1. The spike recoveries fall outside of the established acceptance limits due to matrix interference.	

Originator's Name:
Kristen Parson 19-DEC-12

Data Validator/Group Leader:
Julia Hamilton 20-DEC-12

DATA EXCEPTION REPORT			
Mo.Day Yr. 27-DEC-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: BECY, CELA, ESHL, UREN
Batch ID: 1270973	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 316563(2013-395),316677(2013-409),316714(2013-396),316723(2013-397),316727(2013-398),316749,317006(LS1121812_317006),317207(2013-436),317216 Application Issues: Failed Recovery for MS/PS Failed RPD for DUP			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed Recovery for PS: QC 1202799790MS, QC 1202799791MS 2. Failed RPD for DUP: QC 1202799789DUP		1. The spike recoveries fall outside of the established acceptance limits due to matrix interference. 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 27-DEC-12

Data Validator/Group Leader:

Julia Hamilton 27-DEC-12