

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. Validation Report
4. Laboratory analysis

Comments:

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-142880

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1150		MEDIA:	UA	
PRS ID:	ok		SAMPLE TECH CODE:	PP	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	F	
LOCATION TYPE:	ok		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	✓
BOTTOM DEPTH:	NA	✓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	N	NA
↓	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE	Y	↓
↓	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	N	↓

SAMPLE COMMENTS: well Bailed Dry

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	NA	HH:MM	Dissolved Oxygen	NA	Flow (in gpm)	NA
Oxidation-Reduction Potential	NA		pH	NA	Specific Conductance	NA
Temperature	NA		Turbidity	NA		

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) <i>Tanya Vander Vis</i>	Date/Time 8-30-17 1425	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 8/30/17 1425
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-142915

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1150		MEDIA:	UA	
PRS ID:	ok		SAMPLE TECH CODE:	BIA	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	ok		FIELD QC TYPE:	REG	
TOP DEPTH:	N/A		SAMPLE USAGE:	INV	✓
BOTTOM DEPTH:	N/A		EXCAVATED:		YES / NO (N/A)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
N/A	MSGP-Hg	1000 500 ML POLY 8/29/17	1	HNO3	N	N/A
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	2	ICE	Y	
	WSP-CN(T)	250 ML POLY	1	NAOH	N	
✓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	N	✓

SAMPLE COMMENTS: Bailed well Dry

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1150	HH:MM	Dissolved Oxygen	7.39 mg/L	Flow (in gpm)	N/A
Oxidation-Reduction Potential	71.4 mV		pH	6.96 SU	Specific Conductance	226.4 us/cm
Temperature	13.7°C		Turbidity	408.0 NTU		

COLLECTED BY (PRINT): D. Saramillo, T. Vander Vies

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8/30/17 1425	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/30/17 1425
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143030

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1150		MEDIA:	UA	
PRS ID:	ok		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1	HCL 8/29/17	Y	NA

SAMPLE COMMENTS: ~~None~~ ms 8/30/17 Field Trip Blank approved by SMO.

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	NA	HH:MM	Dissolved Oxygen	NA	Flow (in gpm)	NA
Oxidation-Reduction Potential	NA		pH	NA	Specific Conductance	NA
Temperature	NA		Turbidity	NA		

COLLECTED BY (PRINT): D. Jaramillo

RELINQUISHED BY (Printed Name) Daniel Jaramillo (Signature) <i>[Signature]</i>	Date/Time 8/30/17 1425	RECEIVED BY (Printed Name) M. Martinez (Signature) <i>[Signature]</i>	Date/Time 8/30/17 1425
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143782

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1040		MEDIA:		
PRS ID:	ok		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-26 PZ-2		FIELD PREP:	UF	
LOCATION TYPE:	ok		FIELD QC TYPE:	EQB	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	NA	HH:MM	Dissolved Oxygen	NA	Flow (in gpm)	NA
Oxidation-Reduction Potential	NA		pH	NA	Specific Conductance	NA
Temperature	NA		Turbidity	NA		

COLLECTED BY (PRINT): D. Jaramillo, T. Vander Vies

RELINQUISHED BY (Printed Name) Tanya Vander Vir (Signature) Tanya Vander Vir	Date/Time 8/30/17 1425	RECEIVED BY (Printed Name) M. Monte (Signature) M. Monte	Date/Time 8/30/17 1425
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

COC: 2017-2651

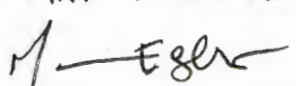
TEST - Field Screen		YES	NO	NA
The sample has field screening measurements of alpha activity and beta activity.				
Activity (dpm/100cm ²)	Sampled Location			
Alpha > 16 and < 20,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			
Alpha > 125 and < 20,000	other locations			
Beta > 1,500 and < 100,000	Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-15, TA-35, TA-36, or TA-39			
Beta > 1,500 and < 100,000	any location			
Alpha activity $\geq 20,000$ dpm/100cm ² and beta activity $\geq 100,000$ dpm/100cm ² and ≥ 0.5 mR/hr on the external surface of the package.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on field screening measurements of alpha and beta activity.				

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.		X		
Activity (dpm/100cm ²)	Sampled Location			
<ul style="list-style-type: none"> Am-241 > 27 and < 27,000 Cs-137 > 270 and < 270,000 Pu-238 > 27 and < 27,000 Pu-239/240 > 27 and < 27,000 Th-228 > 27 and < 27,000 U-238 > 270 and < 270,000 H-3 > 27,000,000 and < 27,000,000,000 	The sampling location is within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-55, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-15, TA-35, TA-36, TA-39, TA-48 or TA-49.		X	
<ul style="list-style-type: none"> Am-241, Pu-238, Pu-239/240, or Th-228 $\geq 27,000$ U-238 $\geq 270,000$ H-3 $\geq 27,000,000,000$ 			X	
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on prior analytical measurements of radioactive isotopes.			X	

TEST - AK		YES	NO	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , and the sample is submitted to ARS or RP for hazard classification analysis.				

HOLD SAMPLES FOR ANALYSIS
The sampling location within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-35, TA-15, TA-36, TA-39, TA-48 or TA-49 AND does not have field screening measurements of alpha and beta activity available AND the sampling location or related sampling location(s) do not have prior reliable analytical measurements of radioactive isotopes available AND knowledge of the sample is not sufficient to identify appropriate labeling.

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

Hazard Assessment Completed By:	Date/Time
(Printed Name) MATT ENGLERT	8-31-17
(Signature) 	10:20

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2651

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
432014	EPA:120.1	1				
432014	EPA:150.1	1				
432014	EPA:160.1	1				
432014	EPA:170.0	2		1		1
432014	EPA:300.0	1				
432014	EPA:310.1	1				
432014	SW-846:6010C	1				
432014	SW-846:6850	1				
432014	SW-846:8260B	1		1		1
432014	SW-846:8330B	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	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
432014	EPA:120.1	1701648	1701648	1										1			2				
432014	EPA:150.1	1698844	1698844	1										1			1				
432014	EPA:160.1	1698442	1698442	1					1					1			1				
432014	EPA:170.0	NA	NA	2		1		1													
432014	EPA:300.0	1699852	1699852	1					1					1			1				
432014	EPA:310.1	1698841	1698841	1						1				1			1				
432014	SW-846:6010C	1697911	1697910	1					1	1				1			1				
432014	SW-846:6850	1698696	1698687	1					1	1	1			1							
432014	SW-846:8260B	1698788	1698788	1		1		1	2					4							
432014	SW-846:8330B	1698678	1698677	1					1	1	1			1							

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
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DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPA-17-142931	1203877745	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142859	1203877746	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142880	432014001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203877744	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142880	432014001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142881	1203871261	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203870477	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142880	432014001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203869507	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203869506	MB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	WST35-17-144902	1203869510	DUP	1	0	0	0
EPA:170.0	VOC	CAWA-17-142880	432014001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142915	432014002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-143030	432014003	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-143782	432014004	EQB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142880	432014001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CrIN1-17-145287	1203872823	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203872822	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203872821	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142880	432014001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142881	1203870473	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142881	1203870475	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203870470	LCS	0	0	1	0
SW-846:6010C	INORGANIC	CAWA-17-142867	1203868281	DUP	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142867	1203868282	MS	0	0	1	0
SW-846:6010C	INORGANIC	CAWA-17-142880	432014001	REG	1	0	0	0
SW-846:6010C	INORGANIC	LCS	1203868280	LCS	0	0	1	0
SW-846:6010C	INORGANIC	MB	1203868279	MB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870073	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870074	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142880	432014001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203870072	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203870071	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-17-142915	432014002	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143030	432014003	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143782	432014004	EQB	80	3	0	0
SW-846:8260B	VOC	LCS	1203870313	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203870314	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203872001	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203872002	LCS	0	3	10	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8260B	VOC	MB	1203870312	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203872000	MB	80	3	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142902	1203870024	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142902	1203870025	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142915	432014002	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203870023	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203870022	MB	23	1	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
CAWA-17-143782	432014004	EQUIPMENT BLANK	EPA:170.0	W	Temperature	3		Deg C	

No.

6. Any surrogate recoveries outside the control limits?

No.

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

DATA VALIDATION REPORT

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

Reason Code

J_LAB

NQ

U_LAB

Description

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

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

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142880	R-26 PZ-2	REG	EPA:120.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142880	R-26 PZ-2	REG	EPA:150.1	0	1
CAWA-17-142880	R-26 PZ-2	REG	EPA:160.1	0	1
CAWA-17-142880	R-26 PZ-2	REG	EPA:170.0	0	1
CAWA-17-142880	R-26 PZ-2	REG	EPA:300.0	0	4
CAWA-17-142880	R-26 PZ-2	REG	EPA:310.1	0	2
CAWA-17-142880	R-26 PZ-2	REG	SW-846:6010C	0	1
CAWA-17-142880	R-26 PZ-2	REG	SW-846:6850	0	1
CAWA-17-142915	R-26 PZ-2	REG	EPA:170.0	0	1
CAWA-17-142915	R-26 PZ-2	REG	SW-846:8260B	0	80
CAWA-17-142915	R-26 PZ-2	REG	SW-846:8330B	0	23
CAWA-17-143030	R-26 PZ-2	FTB	EPA:170.0	0	1
CAWA-17-143030	R-26 PZ-2	FTB	SW-846:8260B	0	80
CAWA-17-143782	R-26 PZ-2	EQB	EPA:170.0	0	1
CAWA-17-143782	R-26 PZ-2	EQB	SW-846:8260B	0	80

September 18, 2017

gel.com

Ms. Nita Patel
Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico 87545

Re: LANL- WQH Water Samples
Work Order: 432014
SDG: 2017-2651

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on September 01, 2017, and analyzed for Explosives by LCMSMS, 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,



Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2017-2651
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 432014
SDG: 2017-2651

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 432014
SDG # : 2017-2651**

September 18, 2017

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 September 01, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. Sample 432014003(CAWA-17-143030) was received with head space.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
432014001	CAWA-17-142880
432014002	CAWA-17-142915
432014003	CAWA-17-143030
432014004	CAWA-17-143782

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: Explosives by LCMSMS, 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.


Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 18 September 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-23
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

Client Contact:

Lab Agreement #:

Project Number: ADEP

Analysis Turnaround Time:

24 Hour - ☐

7 Days - ☐

14 Days - ☐

21 Days - ☐

28 Days - ☒

Other - ☐

Site Name:

Los Alamos National Laboratory

Field Sample ID

Sample Date

Sample Time

Sample Matrix

CAWA-17-142880

Aug 30 2017

11:50

W

CAWA-17-142915

Aug 30 2017

11:50

W

CAWA-17-143030

Aug 30 2017

11:50

W

CAWA-17-143782

Aug 30 2017

10:40

W

WSP-8260B-VOA

WSP-8330B-NMED HEXMOD

WSP-GENINORG+FeChlorate

1

2

2

2

Rad Screening Info:

Lab Reporting Limit Type:

Sample Quantitation Limit:

MOL

Special Instructions:

Relinquished by: H Egar

Relinquished by:

Relinquished by:

Print Name: Matt Engbert

Print Name:

Print Name:

Received by: 3

Received by:

Received by:

Date/Time: 8-31-17 1500

Date/Time:

Date/Time:

Print Name: Joe Washburn

Print Name:

Print Name:

Date/Time: 9/1/17 9:20

Date/Time:

Date/Time:

SAMPLE RECEIPT & REVIEW FORM

Client: ESHC		SDG/AR/COC/Work Order: 432014	
Received By: ZKW		Date Received: 9/1/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1702 6674-5C 5909 1702 6652-4C 5908 1702 6663-3C 5908 1702 6641-3C	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe) _____
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: _____ *all temperatures are recorded in Celsius
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable): _____ TEMP: See Above
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe) _____
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes _____ No <input checked="" type="checkbox"/> N/A _____ Sample ID's and containers affected: -143024 and -143030 rec'd w/ headspace
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____ Collect time for -145077 is 1555 on sample
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____ We only rec'd one cont. for -144835 and -144839
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials **WCH**

Date **9/1/17**

Page **1** of **1**

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: 31AUG17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

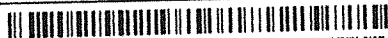
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



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: 31AUG17
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

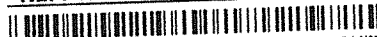
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

5c

CHARLESTON SC 29407

(843) 666-8171

REF: 8A030AW09HSFB00000



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Express



1 of 2
TRK# 5908 1782 6641
0201
MASTER

FRI - 01 SEP 10:30
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS

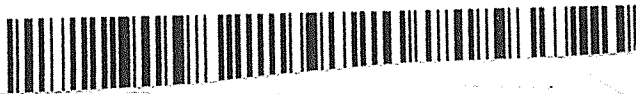
2 of 2
MPS# 5908 1782 6674
0263
Mstr# 5908 1782 6663
0201

FRI - 01 SEP 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS

7-434 RIT2 EXP 02/18



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: 31AUG17
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

RT 25
ST F

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



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: 31AUG17
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

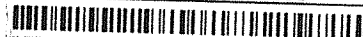
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

3c

CHARLESTON SC 29407

(843) 666-8171

REF: 8A030AW09HSFB00000



FedEx
Express



2 of 2
MPS# 5908 1782 6652
0263
Mstr# 5908 1782 6641
0201

FRI - 01 SEP 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS

1 of 2
RK# 5908 1782 6663
201
MASTER

FRI - 01 SEP 10:3
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



Subject: LANL receipt issues for 09/01/2017
From: Margo Herron <Margo.Herron@gel.com>
Date: 9/1/2017 3:57 PM
To: "Patel, Nita" <npatel@lanl.gov>
CC: "team.davis" <team.davis@gel.com>

Good Afternoon,

Request number 2017-2651 Sample CAWA-17-143030 vial was received with headspace. We will proceed with the analysis unless instructed otherwise.

Request number 2017-2640 Sample CAWA-17-143024 vial was received with headspace. We will proceed with the analysis unless instructed otherwise.

Request number 2017-2647-1 Sample RE02-17-145077 had a collection time of 15:55 on the container and 15:53 on the chain of custody. Please advise to which time you would like us to use.

Request number 2017-2644 Sample WST36-17-144835 had three containers on the chain of custody but we only received one. We will continue with the analysis with just the one container unless instructed otherwise.

Request number 2017-2641 Sample WST36-17-144839 had three containers on the chain of custody but we only received one. We will continue with the analysis with just the one container unless instructed otherwise.

Have a great weekend.

Thanks,

--

Margo Herron
Project Manager Assistant



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417

Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178

E-Mail: Margo.Herron@gel.com | Website: www.gel.com

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<http://www.gellaboratories.com>

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

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

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

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

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

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2651
Work Order #: 432014**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1698788

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
432014002	CAWA-17-142915
432014003	CAWA-17-143030
432014004	CAWA-17-143782
1203870312	Method Blank (MB)
1203870313	Laboratory Control Sample (LCS)
1203870314	Laboratory Control Sample (LCS)
1203870315	431879002(CAWA-17-142897) Post Spike (PS)
1203870316	431879002(CAWA-17-142897) Post Spike (PS)
1203870317	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)
1203870318	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)
1203872000	Method Blank (MB)
1203872001	Laboratory Control Sample (LCS)
1203872002	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 data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 26.

Calibration Information

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

recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

The blanks 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 431879002 (CAWA-17-142897) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

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 samples 432014002 (CAWA-17-142915), 432014003 (CAWA-17-143030) and 432014004 (CAWA-17-143782) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and 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.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually 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 of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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.

System Configuration

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-2651 GEL Work Order: 432014

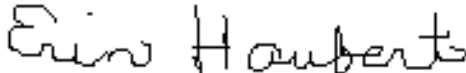
The Qualifiers in this report are defined as follows:

- * 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, MDC 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: 26 SEP 2017

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014002

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client ID: CAWA-17-142915

Batch ID: 1698788

Run Date: 09/09/2017 02:42

Prep Date: 09/09/2017 02:42

Data File: 090817V1\1Y539.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014002

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/09/2017 02:42

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/09/2017 02:42

Data File: 090817V1\1Y539.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		1.07	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014002

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/09/2017 02:42

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/09/2017 02:42

Data File: 090817V1\1Y539.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	56.4	50.0	ug/L 113	(71%-134%)
Bromofluorobenzene	48.5	50.0	ug/L 97	(70%-131%)
Toluene-d8	52.2	50.0	ug/L 104	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014003

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client ID: CAWA-17-143030

Batch ID: 1698788

Run Date: 09/09/2017 03:11

Prep Date: 09/09/2017 03:11

Data File: 090817V1\1Y540.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014003

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client ID: CAWA-17-143030

Batch ID: 1698788

Run Date: 09/09/2017 03:11

Prep Date: 09/09/2017 03:11

Data File: 090817V1\1Y540.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 432014003

Date Collected: 08/30/2017 11:50

Date Received: 09/01/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Batch ID: 1698788

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 09/09/2017 03:11

Inst: VOA1.I

Dilution: 1

Prep Date: 09/09/2017 03:11

Analyst: PXY1

Purge Vol: 5 mL

Data File: 090817V1\1Y540.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.1	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	48.7	50.0	ug/L 97	(70%-131%)
Toluene-d8	51.1	50.0	ug/L 102	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000541-05-9	unknown siloxane	14.549	7.86	ug/L	91	NJ

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651
Lab Sample ID: 432014004

Client ID: CAWA-17-143782
Batch ID: 1698788
Run Date: 09/09/2017 03:40
Prep Date: 09/09/2017 03:40
Data File: 090817V1\1Y541.D

Date Collected: 08/30/2017 10:40
Date Received: 09/01/2017 09:20
Client: ARSL004
Method: SW-846:8260B
Inst: VOA1.I
Analyst: PXY1

Column: DB-624

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651
Lab Sample ID: 432014004

Client ID: CAWA-17-143782
Batch ID: 1698788
Run Date: 09/09/2017 03:40
Prep Date: 09/09/2017 03:40
Data File: 090817V1\1Y541.D

Date Collected: 08/30/2017 10:40
Date Received: 09/01/2017 09:20
Client: ARSL004
Method: SW-846:8260B
Inst: VOA1.I
Analyst: PXY1

Column: DB-624

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-038
Dilution: 1
Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number: 2017-2651

Lab Sample ID: 432014004

Date Collected: 08/30/2017 10:40

Date Received: 09/01/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Batch ID: 1698788

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Run Date: 09/09/2017 03:40

Inst: VOA1.I

Dilution: 1

Prep Date: 09/09/2017 03:40

Analyst: PXY1

Purge Vol: 5 mL

Data File: 090817V1\1Y541.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.3	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	49.9	50.0	ug/L 100	(70%-131%)
Toluene-d8	51.6	50.0	ug/L 103	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2651**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203870313	LCS for batch 1698788	118	110	93
1203870314	LCS for batch 1698788	118	108	91
1203870312	MB for batch 1698788	119	109	98
1203870315	CAWA-17-142897PS	118	107	91
1203870317	CAWA-17-142897PSD	120	108	93
1203870316	CAWA-17-142897PS	119	107	90
1203870318	CAWA-17-142897PSD	117	105	91
1203872001	LCS for batch 1698788	111	107	93
1203872002	LCS for batch 1698788	111	105	94
1203872000	MB for batch 1698788	112	107	99
432014002	CAWA-17-142915	113	104	97
432014003	CAWA-17-143030	108	102	97
432014004	CAWA-17-143782	111	103	100

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(71%-134%)

TOL = Toluene-d8

(74%-124%)

BFB = Bromofluorobenzene

(70%-131%)

* 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 4

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	104	104	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1110	89	61-125
67-64-1	LCS Acetone	250	0.0	261	105	48-157
74-88-4	LCS Iodomethane	250	0.0	232	93	72-128
75-15-0	LCS Carbon disulfide	250	0.0	237	95	69-138
108-05-4	LCS Vinyl acetate	250	0.0	246	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	251	100	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	235	94	66-124
591-78-6	LCS 2-Hexanone	250	0.0	263	105	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	60.1	120	40-160
74-87-3	LCS Chloromethane	50.0	0.0	54.1	108	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	56.2	112	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.1	98	63-137
75-00-3	LCS Chloroethane	50.0	0.0	52.8	106	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	55.0	110	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.9	104	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.7	107	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	50.4	101	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	53.9	108	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	52.7	105	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	51.8	104	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	51.2	102	75-123

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	58.0	116	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	48.6	97	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.1	100	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	54.5	109	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	53.5	107	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	53.5	107	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	47.3	95	74-122
71-43-2	LCS Benzene	50.0	0.0	48.9	98	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	52.7	105	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	48.4	97	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	47.5	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	50.3	101	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.1	106	78-131
108-88-3	LCS Toluene	50.0	0.0	50.7	101	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	57.6	115	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	49.6	99	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	49.4	99	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	52.4	105	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	53.0	106	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	52.8	106	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.0	100	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	52.0	104	73-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	54.4	109	74-126
100-42-5	LCS Styrene	50.0	0.0	52.6	105	72-130
75-25-2	LCS Bromoform	50.0	0.0	53.6	107	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	57.6	115	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	50.1	100	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	52.4	105	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.4	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	53.3	107	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	55.2	110	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	53.9	108	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	52.1	104	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	61.0	122	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	54.9	110	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	57.2	114	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	58.1	116	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	48.8	98	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	48.4	97	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	57.5	115	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	47.5	95	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	55.1	110	72-136
91-20-3	LCS Naphthalene	50.0	0.0	54.5	109	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	58.5	117	70-130

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	59.3	119	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	52.6	105	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	49.7	99	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4870	97	63-138

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870314

Instrument: VOA1.I

Analysis Date: 09/06/2017 10:51

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	246	98	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	247	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	99	59-125
107-13-1	LCS Acrylonitrile	250	0.0	237	95	65-122
107-12-0	LCS Propionitrile	250	0.0	229	92	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	238	95	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	240	96	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	241	96	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2390	96	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	47.9	96	66-147

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	94.3	94	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1120	89	56-131
67-64-1	PS Acetone	250	0.00 U	120	48	25-155
74-88-4	PS Iodomethane	250	0.00 U	227	91	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	216	86	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	232	93	48-133
78-93-3	PS 2-Butanone	250	0.00 U	152	61	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	222	89	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	181	72	33-138
127-18-4	PS Tetrachloroethylene	50.0	0.490 J	46.3	92	60-130
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	51.9	104	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	48.8	98	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.3	97	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	54.2	108	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	47.6	95	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.7	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	49.8	100	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	45.8	92	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.1	96	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	50.6	101	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	47.2	94	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	46.9	94	67-127

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	48.9	98	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	47.8	96	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	48.6	97	71-130
67-66-3	PS Chloroform	50.0	0.00 U	47.4	95	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	48.2	96	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	46.3	93	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	48.7	97	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	47.9	96	69-130
71-43-2	PS Benzene	50.0	0.00 U	45.4	91	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	48.1	96	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	46.6	93	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	48.5	97	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	50.8	102	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	49.9	100	70-134
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	53.6	107	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	48.6	97	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	47.4	95	67-124
124-48-1	PS Dibromochloromethane	50.0	0.00 U	53.9	108	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	51.8	104	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	46.4	93	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	47.2	94	61-130
95-47-6	PS o-Xylene	50.0	0.00 U	50.7	101	62-131

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	PS Styrene	50.0	0.00 U	49.9	100	59-135
75-25-2	PS Bromoform	50.0	0.00 U	54.7	109	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	50.1	100	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.7	97	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	51.3	103	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.5	97	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	47.5	95	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	49.6	99	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	49.4	99	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	47.6	95	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	53.8	108	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	50.6	101	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	51.1	102	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	52.9	106	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.8	94	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	46.0	92	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	52.0	104	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	49.8	100	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	51.8	104	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	54.4	109	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	57.4	115	52-135
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	56.4	113	50-133

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2651

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.1	104	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	48.4	97	60-125
108-88-3	PS Toluene	50.0	12.0	54.7	85	60-126
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5000	100	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	95.4	95	59-132	1 0-20
75-05-8	PSD Acetonitrile	1250	0.00	U	1100	88	56-131	2 0-20
67-64-1	PSD Acetone	250	0.00	U	120	48	25-155	0 0-20
74-88-4	PSD Iodomethane	250	0.00	U	228	91	66-133	1 0-20
75-15-0	PSD Carbon disulfide	250	0.00	U	217	87	61-141	0 0-20
108-05-4	PSD Vinyl acetate	250	0.00	U	232	93	48-133	0 0-20
78-93-3	PSD 2-Butanone	250	0.00	U	152	61	25-143	0 0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	U	224	90	61-127	1 0-20
591-78-6	PSD 2-Hexanone	250	0.00	U	183	73	33-138	1 0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.490	J	47.3	94	60-130	2 0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	U	51.8	104	33-164	0 0-20
74-87-3	PSD Chloromethane	50.0	0.00	U	48.7	97	53-139	0 0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	U	49.9	100	58-140	3 0-20
74-83-9	PSD Bromomethane	50.0	0.00	U	54.2	108	59-146	0 0-20
75-00-3	PSD Chloroethane	50.0	0.00	U	47.7	95	65-129	0 0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	U	48.3	97	65-141	1 0-20
60-29-7	PSD Ethyl ether	50.0	0.00	U	50.9	102	69-127	2 0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	U	46.7	93	59-130	2 0-20
75-09-2	PSD Methylene chloride	50.0	0.00	U	49.4	99	62-123	3 0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	U	51.6	103	69-132	2 0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	U	47.9	96	65-127	2 0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	U	48.2	96	67-127	3 0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	49.8	100	69-127	2	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	47.9	96	66-137	0	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	49.7	99	71-130	2	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	48.6	97	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	48.2	96	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	47.0	94	67-130	1	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	48.8	98	66-143	0	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	48.1	96	69-130	0	0-20
71-43-2	PSD Benzene	50.0	0.00 U	45.7	91	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	49.0	98	65-131	2	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	47.2	94	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	48.9	98	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	51.4	103	70-138	1	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	51.6	103	70-134	3	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	54.7	109	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	49.3	99	66-125	1	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	49.0	98	67-124	3	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	54.9	110	68-143	2	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	52.4	105	71-127	1	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	47.3	95	64-124	2	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	47.9	96	61-130	1	0-20
95-47-6	PSD o-Xylene	50.0	0.00 U	50.5	101	62-131	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2651

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
100-42-5	PSD Styrene	50.0	0.00 U	49.8	100	59-135	0	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	55.8	112	64-138	2	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	51.1	102	55-133	2	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.6	99	62-129	2	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	52.0	104	70-124	1	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	48.9	98	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	47.7	95	50-133	0	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	50.1	100	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	49.2	98	56-128	0	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	47.5	95	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	53.8	108	55-135	0	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	50.1	100	53-132	1	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	50.9	102	50-138	0	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	52.2	104	49-138	1	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.0	92	56-126	2	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	46.0	92	55-125	0	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	50.8	102	43-142	2	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	49.4	99	62-141	1	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	50.8	102	40-147	2	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	55.1	110	62-134	1	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	57.1	114	52-135	1	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	55.8	112	50-133	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2651

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.5	105	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	49.0	98	60-125	1	0-20
108-88-3	PSD Toluene	50.0	12.0	55.2	86	60-126	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4920	98	60-140	1	0-20

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2651

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870316

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:32

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS Acrolein	250	0.00 U	239	96	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	240	96	57-149
107-05-1	PS Allyl chloride	250	0.00 U	240	96	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	243	97	59-129
107-12-0	PS Propionitrile	250	0.00 U	237	95	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	245	98	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	243	97	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	247	99	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2510	101	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	45.4	91	63-146

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2651

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870318

Instrument: VOA1.I

Analysis Date: 09/06/2017 20:01

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00	U	235	94	49-141	2	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	U	234	94	57-149	3	0-20
107-05-1	PSD Allyl chloride	250	0.00	U	233	93	54-128	3	0-20
107-13-1	PSD Acrylonitrile	250	0.00	U	239	96	59-129	2	0-20
107-12-0	PSD Propionitrile	250	0.00	U	231	92	58-131	3	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	U	239	96	59-134	2	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	U	242	97	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	U	242	97	60-136	2	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	U	2470	99	60-143	2	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	U	44.2	88	63-146	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	83.9	84	71-127
75-05-8	LCS Acetonitrile	1250	0.0	977	78	61-125
67-64-1	LCS Acetone	250	0.0	162	65	48-157
74-88-4	LCS Iodomethane	250	0.0	196	79	72-128
75-15-0	LCS Carbon disulfide	250	0.0	180	72	69-138
108-05-4	LCS Vinyl acetate	250	0.0	219	88	67-125
78-93-3	LCS 2-Butanone	250	0.0	173	69	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	200	80	66-124
591-78-6	LCS 2-Hexanone	250	0.0	179	72	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	38.3	77	40-160
74-87-3	LCS Chloromethane	50.0	0.0	42.3	85	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	42.1	84	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.0	92	63-137
75-00-3	LCS Chloroethane	50.0	0.0	43.5	87	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	41.5	83	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	48.0	96	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	38.6	77	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	42.5	85	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	45.6	91	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	40.9	82	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	41.6	83	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	43.6	87	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	39.6	79	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	43.9	88	76-125
67-66-3	LCS Chloroform	50.0	0.0	42.5	85	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	40.9	82	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	39.7	79	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	40.0	80	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	43.0	86	74-122
71-43-2	LCS Benzene	50.0	0.0	40.5	81	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	41.6	83	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.1	84	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	43.6	87	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	45.7	91	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	46.1	92	78-131
108-88-3	LCS Toluene	50.0	0.0	41.2	82	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	49.7	99	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	45.1	90	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	44.1	88	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	39.6	79	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	49.1	98	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	47.6	95	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.2	84	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	42.3	85	73-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	45.2	90	74-126
100-42-5	LCS Styrene	50.0	0.0	45.4	91	72-130
75-25-2	LCS Bromoform	50.0	0.0	50.2	100	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	45.0	90	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	45.0	90	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	47.8	96	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	44.0	88	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	42.1	84	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	44.5	89	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	44.7	89	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	43.1	86	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	47.2	94	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	45.1	90	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	44.5	89	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	45.6	91	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	41.4	83	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	41.0	82	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.3	89	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	44.6	89	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	45.0	90	72-136
91-20-3	LCS Naphthalene	50.0	0.0	50.2	100	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	52.1	104	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	48.7	97	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	47.2	94	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	43.6	87	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4400	88	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-2651

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872002

Instrument: VOA1.I

Analysis Date: 09/09/2017 01:44

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	198	79	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	202	81	61-148
107-05-1	LCS Allyl chloride	250	0.0	219	88	59-125
107-13-1	LCS Acrylonitrile	250	0.0	218	87	65-122
107-12-0	LCS Propionitrile	250	0.0	214	86	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	222	89	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	225	90	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	228	91	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2150	86	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	40.6	81	66-147

Method Blank Summary

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SDG Number:	2017-2651	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698788	Instrument ID:	VOA1.I	Data File:	090617V1\1Y307A.D
Lab Sample ID:	1203870312	Prep Date:	09/06/2017 11:20	Analyzed:	09/06/17 11:20
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 1698788	1203870313	090617V1\1Y303A.D	09/06/17	0924
02 LCS for batch 1698788	1203870314	090617V1\1Y306A.D	09/06/17	1051
03 CAWA-17-142897PS	1203870315	090617V1\1Y322.D	09/06/17	1834
04 CAWA-17-142897PSD	1203870317	090617V1\1Y323.D	09/06/17	1903
05 CAWA-17-142897PS	1203870316	090617V1\1Y324.D	09/06/17	1932
06 CAWA-17-142897PSD	1203870318	090617V1\1Y325.D	09/06/17	2001

Method Blank Summary

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SDG Number:	2017-2651	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698788	Instrument ID:	VOA1.I	Data File:	090817V1\1Y538A.D
Lab Sample ID:	1203872000	Prep Date:	09/09/2017 02:13	Analyzed:	09/09/17 02:13
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
08 LCS for batch 1698788	1203872001	090817V1\1Y535A.D	09/09/17	0045
09 LCS for batch 1698788	1203872002	090817V1\1Y537A.D	09/09/17	0144
10 CAWA-17-142915	432014002	090817V1\1Y539.D	09/09/17	0242
11 CAWA-17-143030	432014003	090817V1\1Y540.D	09/09/17	0311
12 CAWA-17-143782	432014004	090817V1\1Y541.D	09/09/17	0340

Quality Control Data

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651

Lab Sample ID: 1203870312

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 11:20

Prep Date: 09/06/2017 11:20

Data File: 090617V1\1Y307A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203870312		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	MB for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 11:20	Analyst:	PXY1
Prep Date:	09/06/2017 11:20		
Data File:	090617V1\1Y307A.D	Column:	DB-624
		Project:	QC
		SOP Ref:	GL-OA-E-038
		Dilution:	1
		Purge Vol:	5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number: 2017-2651	Matrix: WATER	
Lab Sample ID: 1203870312		
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: MB for batch 1698788	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 11:20	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 11:20		
Data File: 090617V1\1Y307A.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.7	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	48.9	50.0	ug/L 98	(70%-131%)
Toluene-d8	54.4	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2017-2651	Matrix: WATER
Lab Sample ID: 1203870313	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: LCS for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Project: QC
Run Date: 09/06/2017 09:24	SOP Ref: GL-OA-E-038
Prep Date: 09/06/2017 09:24	Dilution: 1
Data File: 090617V1\1Y303A.D	Purge Vol: 5 mL
	Analyst: PXY1
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		54.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		51.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		53.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		58.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.4	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		59.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		54.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		48.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		48.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		48.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		58.0	ug/L	0.300	1.00
78-93-3	2-Butanone		251	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		53.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		263	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		52.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		58.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		235	ug/L	1.50	5.00
67-64-1	Acetone		261	ug/L	1.50	10.0
75-05-8	Acetonitrile		1110	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		48.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.4	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		50.3	ug/L	0.300	1.00
75-25-2	Bromoform		53.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651

Lab Sample ID: 1203870313

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 09:24

Prep Date: 09/06/2017 09:24

Data File: 090617V1\1Y303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		49.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		237	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		53.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.0	ug/L	0.300	1.00
75-00-3	Chloroethane		52.8	ug/L	0.300	1.00
67-66-3	Chloroform		50.1	ug/L	0.300	1.00
74-87-3	Chloromethane		54.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.0	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		60.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.0	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		55.1	ug/L	0.300	1.00
74-88-4	Iodomethane		232	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		57.6	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.4	ug/L	1.00	10.0
91-20-3	Naphthalene		54.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.6	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.4	ug/L	0.300	1.00
108-88-3	Toluene		50.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		55.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		246	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		51.2	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		104	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4870	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		57.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		53.3	ug/L	0.300	1.00
95-47-6	o-Xylene		54.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		57.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203870313		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 09:24	Analyst:	PXY1
Prep Date:	09/06/2017 09:24	Purge Vol:	5 mL
Data File:	090617V1\1Y303A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.9	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		61.0	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		57.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.2	50.0	118	(71%-134%)
Bromofluorobenzene	46.6	50.0	93	(70%-131%)
Toluene-d8	54.8	50.0	110	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651	Matrix: WATER
Lab Sample ID: 1203870314	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: LCS for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Project: QC
Run Date: 09/06/2017 10:51	SOP Ref: GL-OA-E-038
Prep Date: 09/06/2017 10:51	Dilution: 1
Data File: 090617V1\1Y306A.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		47.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		246	ug/L	1.50	5.00
107-13-1	Acrylonitrile		237	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203870314		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 10:51	Analyst:	PXY1
Prep Date:	09/06/2017 10:51		
Data File:	090617V1\1Y306A.D	Column:	DB-624
		Project:	QC
		SOP Ref:	GL-OA-E-038
		Dilution:	1
		Purge Vol:	5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		241	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2390	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		238	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		240	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		229	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		247	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203870314		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 10:51	Analyst:	PXY1
Prep Date:	09/06/2017 10:51		
Data File:	090617V1\1Y306A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	58.9	50.0	ug/L 118	(71%-134%)
Bromofluorobenzene	45.4	50.0	ug/L 91	(70%-131%)
Toluene-d8	53.9	50.0	ug/L 108	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870315	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 18:34	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 18:34		
Data File: 090617V1\1Y322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.1	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		46.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		45.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		57.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		51.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		56.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.9	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		49.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		152	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		49.4	ug/L	0.300	1.00
591-78-6	2-Hexanone		181	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		52.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		222	ug/L	1.50	5.00
67-64-1	Acetone		120	ug/L	1.50	10.0
75-05-8	Acetonitrile		1120	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		50.8	ug/L	0.300	1.00
75-25-2	Bromoform		54.7	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		54.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		216	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		48.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.4	ug/L	0.300	1.00
75-00-3	Chloroethane		47.6	ug/L	0.300	1.00
67-66-3	Chloroform		47.4	ug/L	0.300	1.00
74-87-3	Chloromethane		48.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		51.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		49.8	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		51.8	ug/L	0.300	1.00
74-88-4	Iodomethane		227	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		50.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.1	ug/L	1.00	10.0
91-20-3	Naphthalene		54.4	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.9	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		46.3	ug/L	0.300	1.00
108-88-3	Toluene		54.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		232	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		48.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		94.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5000	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		52.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.5	ug/L	0.300	1.00
95-47-6	o-Xylene		50.7	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		51.1	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.0	50.0	ug/L 118	(71%-134%)
Bromofluorobenzene	45.3	50.0	ug/L 91	(70%-131%)
Toluene-d8	53.3	50.0	ug/L 107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2017-2651	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870316	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:32	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:32		
Data File: 090617V1\1Y324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		45.4	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		239	ug/L	1.50	5.00
107-13-1	Acrylonitrile		243	ug/L	1.50	5.00
107-05-1	Allyl chloride		240	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870316	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:32	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:32		
Data File: 090617V1\1Y324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		247	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2510	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		245	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		243	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		237	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		240	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870316	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:32	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:32		
Data File: 090617V1\1Y324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.6	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	44.9	50.0	ug/L 90	(70%-131%)
Toluene-d8	53.7	50.0	ug/L 107	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870317	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:03	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:03				
Data File:	090617V1\1Y323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.5	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		48.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		46.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		57.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		55.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.1	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		48.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.9	ug/L	0.300	1.00
78-93-3	2-Butanone		152	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		49.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		183	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		52.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		224	ug/L	1.50	5.00
67-64-1	Acetone		120	ug/L	1.50	10.0
75-05-8	Acetonitrile		1100	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		45.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.7	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.4	ug/L	0.300	1.00
75-25-2	Bromoform		55.8	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870317	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:03	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:03				
Data File:	090617V1\1Y323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		54.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		217	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		48.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.3	ug/L	0.300	1.00
75-00-3	Chloroethane		47.7	ug/L	0.300	1.00
67-66-3	Chloroform		48.6	ug/L	0.300	1.00
74-87-3	Chloromethane		48.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		51.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		50.8	ug/L	0.300	1.00
74-88-4	Iodomethane		228	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		49.4	ug/L	1.00	10.0
91-20-3	Naphthalene		55.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.3	ug/L	0.300	1.00
108-88-3	Toluene		55.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		49.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		48.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		232	ug/L	1.50	5.00
75-01-4	Vinyl chloride		49.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.8	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		95.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4920	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		50.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.7	ug/L	0.300	1.00
95-47-6	o-Xylene		50.5	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		50.9	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870317	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:03	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:03				
Data File:	090617V1\1Y323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	60.2	50.0	ug/L 120	(71%-134%)
Bromofluorobenzene	46.3	50.0	ug/L 93	(70%-131%)
Toluene-d8	54.2	50.0	ug/L 108	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870318	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 20:01	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 20:01				
Data File:	090617V1\1Y325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		44.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		235	ug/L	1.50	5.00
107-13-1	Acrylonitrile		239	ug/L	1.50	5.00
107-05-1	Allyl chloride		233	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870318	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 20:01	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 20:01				
Data File:	090617V1\1Y325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		242	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2470	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		239	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		242	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		231	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		234	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	58.3	50.0	ug/L 117	(71%-134%)
Bromofluorobenzene	45.4	50.0	ug/L 91	(70%-131%)
Toluene-d8	52.3	50.0	ug/L 105	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651	Matrix: WATER
Lab Sample ID: 1203872000	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: MB for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Project: QC
Run Date: 09/09/2017 02:13	SOP Ref: GL-OA-E-038
Prep Date: 09/09/2017 02:13	Dilution: 1
Data File: 090817V1\1Y538A.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651

Matrix: WATER

Lab Sample ID: 1203872000

Client Sample: QC for batch 1698788

Client: ARSL004

Project: QC

Client ID: MB for batch 1698788

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/09/2017 02:13

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/09/2017 02:13

Data File: 090817V1\1Y538A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number: 2017-2651	Matrix: WATER	
Lab Sample ID: 1203872000		
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: MB for batch 1698788	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/09/2017 02:13	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/09/2017 02:13		
Data File: 090817V1\1Y538A.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	56.0	50.0	ug/L 112	(71%-134%)
Bromofluorobenzene	49.7	50.0	ug/L 99	(70%-131%)
Toluene-d8	53.4	50.0	ug/L 107	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
No Tentatively Identified Compounds Found				ug/L		

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651		Matrix:	WATER
Lab Sample ID: 1203872001			
Client Sample: QC for batch 1698788	Client: ARSL004	Project:	QC
Client ID: LCS for batch 1698788	Method: SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution:	1
Run Date: 09/09/2017 00:45	Analyst: PXY1	Purge Vol:	5 mL
Prep Date: 09/09/2017 00:45			
Data File: 090817V1\1Y535A.D	Column: DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		47.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		40.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		45.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		45.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.6	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		39.7	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		52.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		47.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		48.7	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.1	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		44.6	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		43.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		43.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.1	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		44.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		41.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		44.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		41.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.6	ug/L	0.300	1.00
78-93-3	2-Butanone		173	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		44.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		179	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		43.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		45.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		200	ug/L	1.50	5.00
67-64-1	Acetone		162	ug/L	1.50	10.0
75-05-8	Acetonitrile		977	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		40.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		44.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		43.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		45.7	ug/L	0.300	1.00
75-25-2	Bromoform		50.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651

Lab Sample ID: 1203872001

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/09/2017 00:45

Prep Date: 09/09/2017 00:45

Data File: 090817V1\1Y535A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		46.0	ug/L	0.300	1.00
75-15-0	Carbon disulfide		180	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		40.0	ug/L	0.300	1.00
108-90-7	Chlorobenzene		42.2	ug/L	0.300	1.00
75-00-3	Chloroethane		43.5	ug/L	0.300	1.00
67-66-3	Chloroform		42.5	ug/L	0.300	1.00
74-87-3	Chloromethane		42.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		49.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		43.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		38.3	ug/L	0.300	1.00
60-29-7	Ethyl ether		48.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.3	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		45.0	ug/L	0.300	1.00
74-88-4	Iodomethane		196	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		42.5	ug/L	1.00	10.0
91-20-3	Naphthalene		50.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		45.4	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		39.6	ug/L	0.300	1.00
108-88-3	Toluene		41.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.6	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		41.5	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		219	ug/L	1.50	5.00
75-01-4	Vinyl chloride		42.1	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		43.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		46.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		83.9	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4400	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.1	ug/L	0.300	1.00
95-47-6	o-Xylene		45.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		44.5	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2651		Matrix: WATER
Lab Sample ID: 1203872001		
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: LCS for batch 1698788	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/09/2017 00:45	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/09/2017 00:45		
Data File: 090817V1\1Y535A.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		45.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		40.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		49.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.6	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	46.3	50.0	ug/L 93	(70%-131%)
Toluene-d8	53.3	50.0	ug/L 107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2651	Matrix: WATER
Lab Sample ID: 1203872002	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: LCS for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Project: QC
Run Date: 09/09/2017 01:44	SOP Ref: GL-OA-E-038
Prep Date: 09/09/2017 01:44	Dilution: 1
Data File: 090817V1\1Y537A.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		40.6	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		198	ug/L	1.50	5.00
107-13-1	Acrylonitrile		218	ug/L	1.50	5.00
107-05-1	Allyl chloride		219	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203872002		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/09/2017 01:44	Analyst:	PXY1
Prep Date:	09/09/2017 01:44		
Data File:	090817V1\1Y537A.D	Column:	DB-624
		Project:	QC
		SOP Ref:	GL-OA-E-038
		Dilution:	1
		Purge Vol:	5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		228	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2150	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		222	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		225	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		214	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		202	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-2651	Matrix:	WATER
Lab Sample ID:	1203872002		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/09/2017 01:44	Analyst:	PXY1
Prep Date:	09/09/2017 01:44	Purge Vol:	5 mL
Data File:	090817V1\1Y537A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	U	0.300	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.5	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	46.9	50.0	ug/L 94	(70%-131%)
Toluene-d8	52.4	50.0	ug/L 105	(74%-124%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2651
Work Order #: 432014**

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: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1698696

Prep Batch Number: 1698687

Sample Analysis

Sample ID	Client ID
432014001	432014001 (CAWA-17-142880)
1203870076	Interference Check Sample (ICS)
1203870071	Method Blank (MB)
1203870072	Laboratory Control Sample (LCS)
1203870073	431853001(CAPA-17-142931) Matrix Spike (MS)
1203870074	431853001(CAPA-17-142931) 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# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial

Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standard(s) (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 spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 431853001 (CAPA-17-142931) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

Sample 1203870073 (MS) failed recovery for Perchlorate-101 at 133%. The acceptance range is from 75-125%. The failure of the MS was due to the background concentration of the parent sample, 431853001 (CAPA-17-142931). The LCS and MSD were within the acceptance range. 1203870073 (CAPA-17-142931MS).

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

The internal 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 DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

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

holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or sample 1203870074 (CAPA-17-142931MSD) required manual integrations due to software limitations. The raw data for the manual integrations will be found with the raw data file.

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 internally corrected for using Perchlorate-O (18).

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 a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. 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

The LC-MS/MS Perchlorate analysis was performed on a Quatro Ultima LC/MS/MS.

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

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-2651 GEL Work Order: 432014

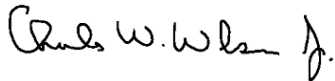
The Qualifiers in this report are defined as follows:

- * 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, MDC 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: Charles Wilson

Date: 08 SEP 2017

Title: Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

CAWA-17-142880Lab Code: GELDate Received: 01-SEP-17Instrument: LCMSMSGEL Job No (SDG): 2017-2651Method: SW846 6850 ModifiedMatrix: WATERGEL Sample ID: 432014001Extraction Batch ID: 1698687Date Filtered: 06-SEP-17Extraction Type: Filter/DAIInjection Volume (uL): 20Sample Volume/Weight: 10.0 mL%Solids: Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.16	ug/L		1	06-SEP-17 22:31	per0906039a
	Perchlorate Isotope Ratio			3.01			1	06-SEP-17 22:31	per0906039a
14797-73-0	Perchlorate-101	.05	.2	1.12	ug/L		1	06-SEP-17 22:31	per0906039a
	Perchlorate-O(18)			0.407	ug/L		1	06-SEP-17 22:31	per0906039a

^ 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): 2017-2651

Extract Batch Code: 1698687

Date Filtered: 06-SEP-17

Matrix: WATER

Sample ID: 1203870072

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	105		85 - 115
Perchlorate Isotope Ratio		2.8				-
Perchlorate-101	0.200	.219	ug/L	109		85 - 115
Perchlorate-O(18)		.455	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): 2017-2651

Extract Batch Code: 1698687

Date Extracted: 06-SEP-17

GEL MS/PS ID: 1203870073

Client ID: CAPA-17-142931

GEL MSD/PSD ID: 1203870074

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	0.750	ug/L	0.943	96	1	125	6	30	75 - 125
Perchlorate Isotope Ratio	0	2.88		2.68		2.89		8		-
Perchlorate-101	0.200	0.756	ug/L	1.02	133 *	1.01	125	2	30	75 - 125
Perchlorate-O(18)	0	0.470	ug/L	0.445		.45		1		-

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 06-SEP-17GEL Job No (SDG): 2017-2651GEL Sample ID: 1203870071Date Filtered: 06-SEP-17Injection 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	06-SEP-17 20:26	per0906025a
	Perchlorate Isotope Ratio						1	06-SEP-17 20:26	per0906025a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	06-SEP-17 20:26	per0906025a
	Perchlorate-O(18)			0.495	ug/L		1	06-SEP-17 20:26	per0906025a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 06-SEP-17GEL Job No (SDG): 2017-2651GEL Sample ID: 1203870072Date Filtered: 06-SEP-17Injection 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	06-SEP-17 20:35	per0906026a
	Perchlorate Isotope Ratio			2.8			1	06-SEP-17 20:35	per0906026a
14797-73-0	Perchlorate-101	.05	.2	0.219	ug/L		1	06-SEP-17 20:35	per0906026a
	Perchlorate-O(18)			0.455	ug/L		1	06-SEP-17 20:35	per0906026a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-2651GEL Sample ID: 1203870076Date Filtered: 06-SEP-17Injection 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	0.242	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate Isotope Ratio			2.94			1	06-SEP-17 20:44	per0906027a
14797-73-0	Perchlorate-101	.05	.2	0.239	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate-O(18)			0.451	ug/L		1	06-SEP-17 20:44	per0906027a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDate Received: 31-AUG-17GEL Job No (SDG): 2017-2651GEL Sample ID: 1203870073Date Filtered: 06-SEP-17Injection 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	0.943	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate Isotope Ratio			2.68			1	06-SEP-17 21:02	per0906029a
14797-73-0	Perchlorate-101	.05	.2	1.02	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate-O(18)			0.445	ug/L		1	06-SEP-17 21:02	per0906029a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDDate Received: 31-AUG-17GEL Job No (SDG): 2017-2651GEL Sample ID: 1203870074Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.00	ug/L		1	06-SEP-17 21:11	per0906030a
	Perchlorate Isotope Ratio			2.89			1	06-SEP-17 21:11	per0906030a
14797-73-0	Perchlorate-101	.05	.2	1.01	ug/L		1	06-SEP-17 21:11	per0906030a
	Perchlorate-O(18)			0.450	ug/L		1	06-SEP-17 21:11	per0906030a

^ 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 =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2651
Work Order #: 432014**

Method/Analysis Information

Procedure: The Processing, Extraction, and Analysis of Nitroaromatics, Nitroamines, and Nitrate Esters by SW-846 8330B

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1698678

Prep Batch Number: 1698677

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8330B:

Sample ID	Client ID
432014002	CAWA-17-142915
1203870022	Method Blank (MB)
1203870023	Laboratory Control Sample (LCS)
1203870024	432041003(CAWA-17-142902) Matrix Spike (MS)
1203870025	432041003(CAWA-17-142902) Matrix Spike Duplicate (MSD)

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-068 REV# 7.

Calibration Information

Initial Calibration

All initial calibration requirements for this analysis have been met for this SDG.

Calibration Verification Standard Requirements

All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

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

The MB analyzed with this SDG for this analysis met the acceptance criteria.

Surrogate Recoveries

All the surrogate recoveries were within the established acceptance criteria in this SDG in this analytical batch for this analysis.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 432041003 (CAWA-17-142902) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in 1203870024 (CAWA-17-142902MS). RDX was recovered at 47% (57-125%). The biased low recovery was attributed to over range concentration of the target analyte in the parent sample, 432041003 (CAWA-17-142902).

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD (See Below) were not within the acceptance limits. Since all other RPD values met acceptance criteria, the noted exceptions are attributed to vagaries in the extraction process. The data are reported.

Sample	Analyte	Value
1203870024MS and 1203870025MSD (CAWA-17-142902)	2,6-Diamino-4-nitrotoluene	48* (0%-30%)

Internal Standard (ISTD) Acceptance

The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

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. 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

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch for this analysis.

Miscellaneous Information

Manual Integrations

Manual integrations were not required for any data file associated with this SDG.

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 0.1 of the analyte's calculated RRT in the ICV.

System Configuration

The laboratory utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LC/MS/MS #3 or LC/MS/MS #4. The laboratory also utilizes a Shimadzu Nexera XC liquid chromatography instrument for Primary and/or Secondary analyte analysis. It is coupled with an Applied Biosystems 5500 Mass Spectrometer/ Mass Spectrometer, designated as LC/MS/MS #5. All are fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte 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

The LC-MS/MS Explosives analysis was performed on a ABSciex 5500 Qtrap LC/MS/MS.

The detection of the Primary and Secondary Nitroaromatic and Nitramine analytes is accomplished through analysis on the following reversed phase column:

Phenomenex: Ultracarb 5u ODS (20), 250 x 4.60 mm ID.

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

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-2651 GEL Work Order: 432014

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, MDC 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: 14 SEP 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142915

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 432014002

Sample Amount 940 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907028.wiff

Date Analyzed: 08-SEP-17 01:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0851	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0851	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.0851	U	0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.0851	U	0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.0851	U	0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0851	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0851	U	0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0851	U	0.0851	0.266
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0851	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0851	U	0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0851	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0851	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142915

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 432014002

Sample Amount 940 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.0851	U	0.0851	0.266
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.0851	U	0.0851	0.266
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0872	U	0.0872	0.266
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.106	U	0.106	0.532
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.16	U	0.160	0.532
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.319	U	0.319	1.06
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.319	U	0.319	1.06
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.319	U	0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.532	U	0.532	2.66
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.532	U	0.532	2.66
6629-29-4	2,4-Diamino-6-nitrotoluene				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-2651**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
432014002	CAWA-17-142915	85	55 - 115	
1203870022	MB for batch 1698677	86	55 - 115	
1203870023	LCS for batch 1698677	86	55 - 115	
1203870024	CAWA-17-142902MS	88	55 - 115	
1203870025	CAWA-17-142902MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Extract Batch Code: 1698677

Date Extracted: 06-SEP-17

GEL LCS ID: 1203870023

GEL LCSDUP ID: .

Analysis Date/Time: 08-SEP-17 01:07

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
1,3,5-Trinitrobenzene	5	4.32	86					70 - 110
2,4,6-Trinitrotoluene	5	4.24	85					69 - 113
2,4-Diamino-6-nitrotoluene	5	3.74	75					50 - 121
2,4-Dinitrotoluene	5	4.05	81					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.23	85					53 - 127
2,6-Dinitrotoluene	5	4.01	80					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.24	85					70 - 112
3,5-Dinitroaniline	5	4.15	83					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.09	82					74 - 116
DNX	.5	.458	92					65 - 113
HMX	5	4.23	85					58 - 113
MNX	.5	.485	97					66 - 114
Nitrobenzene	5	4.1	82					64 - 115
PETN	5	4.11	82					57 - 126
RDX	5	3.72	74					64 - 117
TATB	1.25	1.14	91					47 - 135
TNX	.5	.423	85					51 - 110
Tetryl	5	4.75	95					55 - 122
m-Dinitrobenzene	5	4.71	94					74 - 117
m-Nitrotoluene	5	3.98	80					66 - 114
o-Nitrotoluene	5	3.6	72					64 - 115
p-Nitrotoluene	5	4.24	85					66 - 127
tris(o-cresyl) phosphate	5	3.78	76					43 - 104

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-142902

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Extract Batch Code: 1698677

Date Extracted: 06-SEP-17

GEL Spike ID: 1203870024

GEL SpikeDup ID: 1203870025

Analysis Date/Time: 08-SEP-17 02:53

MSD Analysis Date/Time: 08-SEP-17 03:29

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
2,4-Diamino-6-nitrotoluene	5.43478	0	4.17	77	4.71	87	12	30	50 - 121
2,4-Dinitrotoluene	5.43478	.0412	4.76	87	5.08	93	7	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.43478	0	3.94	72	6.44	118	48 *	30	53 - 127
2,6-Dinitrotoluene	5.43478	0	4.51	83	4.57	84	1	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.43478	.372	5.18	88	5.25	90	1	30	67 - 115
3,5-Dinitroaniline	5.43478	.095	4.75	86	5.04	91	6	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.43478	.358	4.9	84	4.88	83	0	30	65 - 120
DNX	.54348	0	.523	96	.495	91	5	30	53 - 124
HMX	5.43478	1.23	6.14	90	5.68	82	8	30	44 - 128
MNX	.54348	.12	.641	96	.588	86	9	30	60 - 121
Nitrobenzene	5.43478	0	3.82	70	3.94	73	3	30	62 - 116
PETN	5.43478	0	4.44	82	4.69	86	5	30	51 - 131
RDX	5.43478	18.2	21.4	59	20.7	47 *	3	30	57 - 125
TATB	1.3587	0	1.28	95	1.3	96	2	30	38 - 149
TNX	.54348	0	.54	99	.496	91	8	30	46 - 120
Tetryl	5.43478	0	5	92	4.69	86	6	30	50 - 126
m-Dinitrobenzene	5.43478	0	5.08	93	4.67	86	8	30	74 - 117
m-Nitrotoluene	5.43478	0	3.83	71	4.02	74	5	30	59 - 120
o-Nitrotoluene	5.43478	0	4.35	80	4.42	81	2	30	56 - 119
p-Nitrotoluene	5.43478	0	5.13	94	4.85	89	5	30	61 - 129
tris(o-cresyl) phosphate	5.43478	0	3.62	67	3.38	62	7	30	38 - 105
1,3,5-Trinitrobenzene	5.43478	0	4.8	88	4.35	80	10	30	67 - 111
2,4,6-Trinitrotoluene	5.43478	.0897	4.68	85	4.85	88	3	30	66 - 112

#Column to be used to flag recovery and RPD values with an asterisk

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870022

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907026.wiff

Date Analyzed: 08-SEP-17 00:31

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.08	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.08	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.08	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.08	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.08	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.08	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.08	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.08	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.08	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.08	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.08	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.08	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.08	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870022

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.08	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.08	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.082	U	0.082	0.250
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.1	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.15	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.3	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.3	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.3	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870023

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907027.wiff

Date Analyzed: 08-SEP-17 01:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.423		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.458		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
5755-27-1	MNX	.485		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
3058-38-6	TATB	1.14		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
88-72-2	o-Nitrotoluene	3.6		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	3.72		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.74		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
78-30-8	tris(o-cresyl) phosphate	3.78		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
99-08-1	m-Nitrotoluene	3.98		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.01		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.05		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.09		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.1		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870023

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	4.11		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
618-87-1	3,5-Dinitroaniline	4.15		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
2691-41-0	HMX	4.23		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.23		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.24		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.24		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.24		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.32		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	4.71		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	4.75		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902(432041003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870024

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907030.wiff

Date Analyzed: 08-SEP-17 02:53

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.523		0.087	0.272
80251-29-2	DNX				
13980-04-6	TNX	.54		0.087	0.272
13980-04-6	TNX				
5755-27-1	MXN	.641		0.087	0.272
5755-27-1	MXN				
3058-38-6	TATB	1.28		0.326	1.09
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	3.62		0.326	1.09
78-30-8	tris(o-cresyl) phosphate				
98-95-3	Nitrobenzene	3.82		0.087	0.272
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	3.83		0.087	0.272
99-08-1	m-Nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	3.94		0.543	2.72
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.17		0.543	2.72
6629-29-4	2,4-Diamino-6-nitrotoluene				
88-72-2	o-Nitrotoluene	4.35		0.0891	0.272
88-72-2	o-Nitrotoluene				
78-11-5	PETN	4.44		0.109	0.543
78-11-5	PETN				
606-20-2	2,6-Dinitrotoluene	4.51		0.087	0.272
606-20-2	2,6-Dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	4.68		0.087	0.272
118-96-7	2,4,6-Trinitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902(432041003MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870024

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	4.75		0.326	1.09
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	4.76		0.087	0.272
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	4.8		0.087	0.272
19406-51-0 <i>19406-51-0</i>	4-Amino-2,6-dinitrotoluene <i>4-Amino-2,6-dinitrotoluene</i>	4.9		0.087	0.272
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	5		0.087	0.543
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	5.08		0.087	0.272
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	5.13		0.163	0.543
35572-78-2 <i>35572-78-2</i>	2-Amino-4,6-dinitrotoluene <i>2-Amino-4,6-dinitrotoluene</i>	5.18		0.087	0.272
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	6.14		0.087	0.272
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	21.4		0.087	0.272

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902(432041003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870025

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907031.wiff

Date Analyzed: 08-SEP-17 03:29

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.495		0.087	0.272
80251-29-2	DNX				
13980-04-6	TNX	.496		0.087	0.272
13980-04-6	TNX				
5755-27-1	MNX	.588		0.087	0.272
5755-27-1	MNX				
3058-38-6	TATB	1.3		0.326	1.09
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	3.38		0.326	1.09
78-30-8	tris(o-cresyl) phosphate				
98-95-3	Nitrobenzene	3.94		0.087	0.272
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	4.02		0.087	0.272
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	4.35		0.087	0.272
99-35-4	1,3,5-Trinitrobenzene				
88-72-2	o-Nitrotoluene	4.42		0.0891	0.272
88-72-2	o-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.57		0.087	0.272
606-20-2	2,6-Dinitrotoluene				
99-65-0	m-Dinitrobenzene	4.67		0.087	0.272
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	4.69		0.087	0.543
479-45-8	Tetryl				
78-11-5	PETN	4.69		0.109	0.543
78-11-5	PETN				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902(432041003MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2651

Matrix: WATER

GEL Sample ID: 1203870025

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
6629-29-4	2,4-Diamino-6-nitrotoluene	4.71		0.543	2.72
6629-29-4	2,4-Diamino-6-nitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	4.85		0.087	0.272
118-96-7	2,4,6-Trinitrotoluene				
99-99-0	p-Nitrotoluene	4.85		0.163	0.543
99-99-0	p-Nitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.88		0.087	0.272
19406-51-0	4-Amino-2,6-dinitrotoluene				
618-87-1	3,5-Dinitroaniline	5.04		0.326	1.09
618-87-1	3,5-Dinitroaniline				
121-14-2	2,4-Dinitrotoluene	5.08		0.087	0.272
121-14-2	2,4-Dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.25		0.087	0.272
35572-78-2	2-Amino-4,6-dinitrotoluene				
2691-41-0	HMX	5.68		0.087	0.272
2691-41-0	HMX				
59229-75-3	2,6-Diamino-4-nitrotoluene	6.44		0.543	2.72
59229-75-3	2,6-Diamino-4-nitrotoluene				
121-82-4	RDX	20.7		0.087	0.272
121-82-4	RDX				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2651Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 07-SEP-17 09:45GEL Data File: EXP0907001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	376.91
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2651Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 07-SEP-17 10:20GEL Data File: EXP0907002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2651

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 07-SEP-17 15:04

GEL Data File: EXP0907010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2651

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 07-SEP-17 17:26

GEL Data File: EXP0907014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2651

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 07-SEP-17 22:09

GEL Data File: EXP0907022.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2651

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 07-SEP-17 23:20

GEL Data File: EXP0907024.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2651

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 08-SEP-17 07:02

GEL Data File: EXP0907037.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2651
Work Order #: 432014

Sample ID	Client ID
432014001	CAWA-17-142880
1203868279	Method Blank (MB)ICP
1203868280	Laboratory Control Sample (LCS)
1203868283	432041001(CAWA-17-142867L) Serial Dilution (SD)
1203868281	432041001(CAWA-17-142867D) Sample Duplicate (DUP)
1203868282	432041001(CAWA-17-142867S) Matrix Spike (MS)

Sample Analysis

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

Method/Analysis Information

Analytical Batch:	1697911
Prep Batch :	1697910
Standard Operating Procedures:	GL-MA-E-013 REV# 29 and GL-MA-E-006 REV# 13
Analytical Method:	SW846 3005A/6010C
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

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

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

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

criteria.

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

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: 432041001 (CAWA-17-142867).

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

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 reporting 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. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

GEL assigns holding times based on the associated methodology. Holding time is measured by comparison of the date and time of sample collection to the date and time of sample preparation and analysis. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The sample in this SDG did not require dilutions.

Preparation Information

The sample in this SDG was not diluted and were prepared according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

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

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

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-2651 GEL Work Order: 432014

The Qualifiers in this report are defined as follows:

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

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: Nik-Cole Elmore

Date: 28 SEP 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2651**CONTRACT:** ESHL00114**METHOD TYPE:** SW846**SAMPLE ID:** 432014001**BASIS:** As Received**DATE COLLECTED** 30-AUG-17**CLIENT ID:** CAWA-17-142880**LEVEL:** Low**DATE RECEIVED** 01-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7631-86-9	Silica	30300	ug/L		53	213	213	1	P	JWJ	09/19/17 14:10	091917-1	1697911

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1697911	1697910	SW846 3005A	50	mL	50	mL	09/06/17	JXM8

Analytical Methods:*P** SW846 3005A/6010C

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2651
Contract: ESHL00114
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>
1203868279	Silica	53	ug/L	+/-213	U	P	53	213

***Analytical Methods:**

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2651 **Client ID:** CAWA-17-142867S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 432041001 **Spike ID:** 1203868282

<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>
Silica	ug/L		54300		44300		10700	93	N/A	P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2651**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-17-142867D**Matrix:** WATER**Level:** Low**Sample ID:** 432041001**Duplicate ID:** 1203868281**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Silica	ug/L	+/-20%	44300		44100		.418		P

Analytical Methods:*P** SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-2651

Contract: ESHL00114

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>
1203868280	Silica	ug/L	10700	10300		95.8	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-2651 **Client ID:** CAWA-17-142867L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 432041001 **Serial Dilution ID:** 1203868283

<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>
Silica	44300		46700		5.437		10	P

*Analytical Methods:

P SW846 3005A/6010C

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2651
Work Order #: 432014**

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1699852 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
432014001	CAWA-17-142880
1203872821	Method Blank (MB)
1203872822	Laboratory Control Sample (LCS)
1203872823	432546001(CrIN1-17-145287) Sample Duplicate (DUP)
1203872824	432546001(CrIN1-17-145287) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 25.

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-5000 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 Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432546001 (CrIN1-17-145287) was selected for QC analysis.

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

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

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

Manual Integrations

Samples 1203872823 (CrIN1-17-145287DUP), 1203872824 (CrIN1-17-145287PS) and 432014001 (CAWA-17-142880) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1698442

Method: TDS

Sample Analysis

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

Sample ID	Client ID
432014001	CAWA-17-142880
1203869506	Method Blank (MB)
1203869507	Laboratory Control Sample (LCS)
1203869510	431851001(WST35-17-144902) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 431851001 (WST35-17-144902) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1203869510 (WST35-17-144902DUP)	5.66* (0%-5%)

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

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: Specific Conductivity

Analytical Batch: 1701648

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
432014001	CAWA-17-142880
1203877744	Laboratory Control Sample (LCS)
1203877745	431853001(CAPA-17-142931) Sample Duplicate (DUP)
1203877746	432189001(CAWA-17-142859) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 14.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 431853001 (CAPA-17-142931) and 432189001 (CAWA-17-142859) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

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: 1698844 **Method:** PH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 150.1 1982:

Sample ID	Client ID
432014001	CAWA-17-142880
1203870477	Laboratory Control Sample (LCS)
1203871261	432105009(CAWA-17-142881) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 22.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration and Ion analysis was performed on a Thermo Orion Star A111. Immediates

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432105009 (CAWA-17-142881) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203871261 (CAWA-17-142881DUP)	pH	Received 02-SEP-17, out of holding 31-AUG-17
432014001 (CAWA-17-142880)	pH	Received 01-SEP-17, out of holding 30-AUG-17

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**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: 1698841 **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
432014001	CAWA-17-142880
1203870470	Laboratory Control Sample (LCS)
1203870473	432105009(CAWA-17-142881) Sample Duplicate (DUP)
1203870475	432105009(CAWA-17-142881) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 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 Titration and Ion analysis was performed on a Electronic bottle-top buret.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432105009 (CAWA-17-142881) was selected for QC analysis.

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

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

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

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.

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Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-2651 GEL Work Order: 432014

The Qualifiers in this report are defined as follows:

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

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: Kristen Mizzell

Date: 25 SEP 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 25, 2017

Company : Los Alamos National Laboratory
Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2017-2651

Client Sample ID: CAWA-17-142880
Sample ID: 432014001
Matrix: W
Collect Date: 30-AUG-17 11:50
Receive Date: 01-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0836	0.067	0.200	mg/L		1	MXL2	09/12/17	1628	1699852	1
Chloride		9.82	0.067	0.200	mg/L		1					
Fluoride	J	0.0688	0.033	0.100	mg/L		1					
Sulfate		4.18	0.133	0.400	mg/L		1					
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		143	3.40	14.3	mg/L			KLP1	09/05/17	1326	1698442	2
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO ₃		96.0	1.45	4.00	mg/L			RXB5	09/07/17	1631	1698841	3
Carbonate alkalinity (CaCO ₃)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		250	1.00	1.00	umhos/cm		1	VH1	09/20/17	1509	1701648	4
PH "As Received"												
pH at Temp 12.8C	H	7.50	0.010	0.100	SU		1	RXB5	09/07/17	1651	1698844	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA:300.0	
2	EPA:160.1	
3	EPA:310.1	
4	EPA:120.1	
5	EPA 150.1 1982	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: September 25, 2017

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Los Alamos National Laboratory
TA-00, SM1237, Rm104C
Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 432014

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
QC1203872823	432546001	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	09/12/17	19:51
Chloride			6.99		6.98	mg/L	0.146	(0%-20%)			
Fluoride			0.290		0.294	mg/L	1.37 ^	(+/-0.100)			
Sulfate			9.17		9.19	mg/L	0.245	(0%-20%)			
QC1203872822	LCS										
Bromide		1.25			1.18	mg/L	94.1	(80%-120%)		09/12/17	13:35
Chloride		5.00			4.76	mg/L	95.2	(80%-120%)			
Fluoride		2.50			2.37	mg/L	94.7	(80%-120%)			
Sulfate		10.0			9.49	mg/L	94.9	(80%-120%)			
QC1203872821	MB										
Bromide			U		ND	mg/L				09/12/17	13:06
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203872824	432546001	PS									
Bromide		1.25	U		ND	1.28	mg/L	97.2	(75%-125%)	09/12/17	20:20

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QC Summary

Workorder: 432014

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
Chloride	5.00	6.99		12.5	mg/L		110	(75%-125%)	MXL2	09/12/17	20:20
Fluoride	2.50	0.290		2.67	mg/L		95.3	(75%-125%)			
Sulfate	10.0	9.17		19.7	mg/L		105	(75%-125%)			
Solids Analysis											
Batch	1698442										
QC1203869510	431851001	DUP									
Total Dissolved Solids		417		441	mg/L	5.66*		(0%-5%)	KLP1	09/05/17	13:26
QC1203869507	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		09/05/17	13:26
QC1203869506	MB										
Total Dissolved Solids			U	ND	mg/L					09/05/17	13:26
Titration and Ion Analysis											
Batch	1698841										
QC1203870473	432105009	DUP									
Alkalinity, Total as CaCO3		48.5		47.9	mg/L	1.24		(0%-20%)	RXB5	09/07/17	17:05
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203870470	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		09/07/17	15:57
QC1203870475	432105009	MS									
Alkalinity, Total as CaCO3	100	48.5		150	mg/L		102	(80%-120%)		09/07/17	17:06
Batch	1698844										
QC1203871261	432105009	DUP									
pH		H	7.76	H	7.80	SU	0.514	(0%-5%)	RXB5	09/07/17	16:55

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QC Summary

Workorder: 432014

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1698844										
QC1203870477	LCS										
pH	7.00			7.00	SU		100	(99%-101%)	RXB5	09/07/17	16:49
Batch	1701648										
QC1203877745	431853001	DUP									
Conductivity		267		268	umhos/cm	0.374		(0%-10%)	VH1	09/20/17	15:07
QC1203877746	432189001	DUP									
Conductivity		199		199	umhos/cm	0		(0%-10%)		09/20/17	15:12
QC1203877744	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		09/20/17	15:05

Notes:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- d 5-day BOD--The 2:1 depletion requirement was not met for this sample
- e 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes

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QC Summary

Workorder: 432014

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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 or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

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