

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:

General Engineering Charleston SC		Chain of Custody/Analysis Request														COC/Lab Request #: 2018-1240 Page 1 of 1												
Client Contact:		Lab Agreement #:			Site Name: Los Alamos National Laboratory														Rad Screening Info:  Lab Reporting Limit Type: Method Detection Limit:									
		Project Number: 405P																										
		Analysis Turnaround Time:																										
		24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/>																										
		7 Days - <input type="checkbox"/>																										
		14 Days - <input type="checkbox"/>																										
		21 Days - <input type="checkbox"/>																										
		28 Days - <input checked="" type="checkbox"/>																										
Field Sample ID	Sample Date	Sample Time	Sample Matrix	MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-8330B-NMED HEXMOD	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC														
CAWA-18-148918	Dec 11 2017	10:31	W	1	2	2	3		1		1		1	1														
CAWA-18-148940	Dec 11 2017	10:31	W		2																							
CAWA-18-148943	Dec 11 2017	10:31	W	1	2	2	3		1		1		1	1														
CAWA-18-150366	Dec 11 2017	10:56	W					1		1		1																
CAWA-18-150367	Dec 11 2017	10:56	W		2	2	3							1														
CAWA-18-150418	Dec 11 2017	10:31	W					1		1		1																
CAWA-18-150419	Dec 11 2017	10:31	W					1		1		1																
Special Instructions:																												
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:				Date/Time:								
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:				Date/Time:								
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:				Date/Time:								

# SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-148918

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	KT 12/11/17 10:31		MEDIA:	NA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8290-D/F	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossAB	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-148918

WORK ORDER:

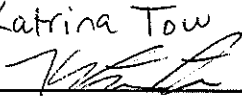
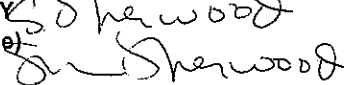
SAMPLE COMMENTS: Sampled 40 ft from running diesel generator

LOCATION COMMENTS: None

## FIELD PARAMETERS:

Sample Time	<u>1031</u>	HH:MM	Discharge Rate	<u>5.66</u>	Dissolved Oxygen	<u>5.68</u>
Groundwater Elevation	<u>6182.70</u>		Oxidation-Reduction Potential	<u>36.5</u>	Period Purge Volume	<u>NA</u>
pH	<u>7.45</u>		Purge Volume	<u>283.0</u>	Specific Conductance	<u>112.8</u>
Temperature	<u>13.9</u>		Total Volume Pumped	<u>339.60</u>	Turbidity	<u>7.02</u>

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow 	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	Sherwood 	Date/Time 12/11/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-148940

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1031		MEDIA:	OK	
PRS ID:	NA		SAMPLE TECH CODE:	KT 12/11/17 GSP DC	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:	↓		SAMPLE USAGE:	QC	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1/2 DTH 12-11-17	HCL	Y	NA

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

## FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Discharge Rate \_\_\_\_\_ Dissolved Oxygen \_\_\_\_\_  
 Groundwater Elevation \_\_\_\_\_ Oxidation-Reduction Potential \_\_\_\_\_ Period Purge Volume \_\_\_\_\_  
 pH \_\_\_\_\_ Purge Volume \_\_\_\_\_ Specific Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Total Volume Pumped \_\_\_\_\_ Turbidity \_\_\_\_\_

KT 12/11/17

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	Sherwood <i>[Signature]</i>	Date/Time 12/11/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-148943

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1031		MEDIA:	NA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FD	
TOP DEPTH:	↓		SAMPLE USAGE:	QC	
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8290-D/F	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY****EVENT ID:** 11605**EVENT NAME:** Water/CdV (TA16 260) Q1 MY2018**SAMPLE ID:** CAWA-18-148943**WORK ORDER:****SAMPLE COMMENTS:**~~12/11/17~~ <sup>KT 12/11/17</sup> None**LOCATION COMMENTS:**~~12/11/17~~ <sup>KT 12/11/17</sup> None**FIELD PARAMETERS:**

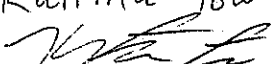
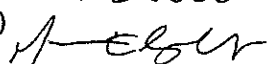
~~KT 12/11/17~~

Sample Time	HH:MM	Discharge Rate		Dissolved Oxygen	
Groundwater Elevation		Oxidation-Reduction Potential		Period Purge Volume	
pH		Purge Volume		Specific Conductance	
Temperature		Total Volume Pumped		Turbidity	

~~KT 12/11/17~~

**COLLECTED BY (PRINT):**

T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow 	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	MAT ENQUERA 	Date/Time 12-11-17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 12/01/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-150366

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1056		MEDIA:	NA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:	↓		SAMPLE USAGE:	TEST	
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	6 CVs
↓	WSP- GENINORG+PerChlorate	1 LITER POLY	1	ICE	↓	NA
↓	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

## FIELD PARAMETERS:

Sample Time	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____	Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____	Purge Volume	_____	Specific Conductance	_____
Temperature	_____	Total Volume Pumped	_____	Turbidity	_____

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	Sherwood <i>[Signature]</i>	Date/Time 12/11/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-150367

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1056		MEDIA:	NA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:	↓		SAMPLE USAGE:	TEST	↓
BOTTOM DEPTH:	↓	↓	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
↓	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: Sampled 40 ft from running diesel generator

LOCATION COMMENTS: None

## FIELD PARAMETERS:

Sample Time	1056	HH:MM	Discharge Rate	5.66	Dissolved Oxygen	5.65
Groundwater Elevation	6182.56		Oxidation-Reduction Potential	74.3	Period Purge Volume	NA
pH	7.44		Purge Volume	283.00	Specific Conductance	112.8
Temperature	14.1		Total Volume Pumped	339.60	Turbidity	7.67

COLLECTED BY (PRINT): KT 12/11/17  
T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>[Signature]</i>	Date/Time 12/11/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-150418

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1031		MEDIA:	NA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-N15/O18-NO3	40 mL Glass	2	ICE		
	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

## FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Discharge Rate \_\_\_\_\_ Dissolved Oxygen \_\_\_\_\_  
 Groundwater Elevation \_\_\_\_\_ Oxidation-Reduction Potential \_\_\_\_\_ Period Purge Volume \_\_\_\_\_  
 pH \_\_\_\_\_ Purge Volume \_\_\_\_\_ Specific Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Total Volume Pumped \_\_\_\_\_ Turbidity \_\_\_\_\_

KT 12/11/17

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	MATT ENGLERT <i>[Signature]</i>	Date/Time 12-11-17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11605

EVENT NAME: Water/CdV (TA16 260) Q1 MY2018

SAMPLE ID: CAWA-18-150419

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	12/11/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1031		MEDIA:	OK	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	FD	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-N15/O18- NO3	40 mL Glass	2	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

None

LOCATION COMMENTS:

None

FIELD PARAMETERS:

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Discharge Rate \_\_\_\_\_ *KT 12/11/17* Dissolved Oxygen \_\_\_\_\_  
 Groundwater Elevation \_\_\_\_\_ Oxidation-Reduction Potential \_\_\_\_\_ Period Purge Volume \_\_\_\_\_  
 pH \_\_\_\_\_ Purge Volume \_\_\_\_\_ Specific Conductance \_\_\_\_\_  
 Temperature \_\_\_\_\_ Total Volume Pumped \_\_\_\_\_ Turbidity \_\_\_\_\_

COLLECTED BY (PRINT):

T. Vander Vis

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 12/11/17 1156	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>[Signature]</i>	Date/Time 12/11/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

TEST - Explosives		YES	NO
Samples collected from a WFO area? (TAs -08, 09, 11, 14, 15, 16, 22, 36, 37, 39, 40, and 49)			<input checked="" type="checkbox"/>
Field Test for Explosives Results		YES	NO
HE SPOT test result positive. If YES - Do not transport.			<input checked="" type="checkbox"/>

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		<input checked="" type="checkbox"/>	
Field Team Member Statement		YES	NO
Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.			<input checked="" type="checkbox"/>

TEST - Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				<input checked="" type="checkbox"/>
Sample Activity (dpm/100cm <sup>2</sup> )	Shipment Activity (dpm*g/100cm <sup>2</sup> )	Sampled Location	YES	NO
Alpha detectable	AND Alpha ≥ 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		<input checked="" type="checkbox"/>
Alpha ≥ 125	AND Alpha ≥ 1,250,000	AT other locations		<input checked="" type="checkbox"/>
Beta ≥ 1,500	AND Beta ≥ 15,000,000	AT any location		<input checked="" type="checkbox"/>
The sample Alpha ≥ 16,000,000 dpm*g/100cm <sup>2</sup> or Beta ≥ 160,000,000 dpm*g/100cm <sup>2</sup> . If YES - Do not ship.				<input checked="" type="checkbox"/>
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm <sup>2</sup> , beta activity ≥ 240 dpm/cm <sup>2</sup> , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.				<input checked="" type="checkbox"/>
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity.				<input checked="" type="checkbox"/>

TEST - Location		YES	NO
Prior analytical measurements of radioactive isotopes are available?		<input checked="" type="checkbox"/>	
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO
• Am-241 ≥ 27 pCi/g	AND Am-241 ≥ 270,000 pCi Total		
• Cs-137 ≥ 270 pCi/g	AND Cs-137 ≥ 270,000 pCi Total		
• Pu-238 ≥ 27 pCi/g	AND Pu-238 ≥ 270,000 pCi Total		<input checked="" type="checkbox"/>
• Pu-239/240 ≥ 27 pCi/g	AND Pu-239/240 ≥ 270,000 pCi Total		
• Th-228 ≥ 27 pCi/g	AND Th-228 ≥ 270,000 pCi Total		
• U-234 ≥ 270 pCi/g	AND U-234 ≥ 1,600,000,000 pCi Total		
• U-238 ≥ 270 pCi/g	AND U-238 ≥ unlimited		
• H-3 ≥ 27,000,000 pCi/g	AND H-3 ≥ 27,000,000,000 pCi Total		
Am-241, Pu-238, Pu-239/240, or Th-228 ≥ 27,000,000 pCi; or Cs-137 ≥ 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.			<input checked="" type="checkbox"/>
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.			<input checked="" type="checkbox"/>

TEST - AK		YES	NO
The shippers documented knowledge of the sample positively identifies appropriate labeling.			<input checked="" type="checkbox"/>
Documented Field Team Member Statement		YES	NO
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.			<input checked="" type="checkbox"/>

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) <u>Katrina Tow</u>	<u>12/11/17</u>
(Signature) <u>[Signature]</u>	<u>1156</u>

R-68

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>J. Sherwood</u>	<u>12/11/17</u>
(Signature) <u>[Signature]</u>	<u>1156</u>

ER-SOP-10094, R1, Attachmen

## DATA VALIDATION REPORT

Chain Of Custody No. 2018-1240

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
439936	EPA:120.1	1	1			
439936	EPA:150.1	1	1			
439936	EPA:160.1	1	1			
439936	EPA:170.0	2	2	1		
439936	EPA:245.2	2	2			
439936	EPA:300.0	1	1			
439936	EPA:310.1	1	1			
439936	EPA:335.4	1	1			
439936	EPA:350.1	1	1			
439936	EPA:351.2	1	1			
439936	EPA:353.2	1	1			
439936	EPA:365.4	1	1			
439936	EPA:900	1	1			
439936	EPA:901.1	1	1			
439936	EPA:905.0	1	1			
439936	HASL-300:AM-241	1	1			
439936	HASL-300:ISOPU	1	1			
439936	HASL-300:ISOU	1	1			
439936	SM:A2340B	1	1			
439936	SW-846:6010C	1	1			
439936	SW-846:6020	1	1			
439936	SW-846:6850	1	1			
439936	SW-846:8260B	1	1	1		
439936	SW-846:8270D	1	1			
439936	SW-846:8330B	1	1			
439936	SW-846:9060	1	1			

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

## DATA VALIDATION REPORT

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
439936	EPA:120.1	1728640	1728640	1	1									1			1				
439936	EPA:150.1	1727518	1727518	1	1									1			2				
439936	EPA:160.1	1727170	1727170	1	1				1					1			1				
439936	EPA:170.0	NA	NA	2	2	1															
439936	EPA:245.2	1729720	1729719	2	2				1	1				1			1				
439936	EPA:300.0	1727180	1727180	1	1				1					1			1				
439936	EPA:310.1	1727515	1727515	1	1					2				1			2				
439936	EPA:335.4	1726228	1726227	1	1				1	1				1			1				
439936	EPA:350.1	1725911	1725910	1	1				1	1				1			1				
439936	EPA:351.2	1726143	1726142	1	1				1	2				1			2				
439936	EPA:353.2	1726147	1726147	1	1				1					1			1				
439936	EPA:365.4	1725512	1725511	1	1				1	1				1			1				
439936	EPA:900	1726298	1726298	1	1				1	1	1			1			1				
439936	EPA:901.1	1726215	1726215	1	1				1					1			1				
439936	EPA:905.0	1726106	1726106	1	1				1	1				1			1				
439936	HASL-300:AM-241	1726037	1726037	1	1				1					1			1				
439936	HASL-300:ISOPU	1729763	1729763	1	1				1					1			1				
439936	HASL-300:ISOU	1726039	1726039	1	1				1					1			1				
439936	SM:A2340B	1730402	1730402	1	1																
439936	SW-846:6010C	1726059	1726058	1	1				1	1				1			1				
439936	SW-846:6020	1726070	1726069	1	1				1	1				1			1				
439936	SW-846:6020	1730504	1730502	1	1				1	1				1			1				
439936	SW-846:6850	1727162	1727161	1	1				1	1	1			1							
439936	SW-846:8260B	1728172	1728172	1	1	1			2					4							
439936	SW-846:8270D	1725973	1725968	1	1				1	1	1			1	1						
439936	SW-846:8330B	1726272	1726271	1	1				1	1	1			1							
439936	SW-846:9060	1725569	1725569	1	1				1					1			1				

### 2. Distribution Of Analytes In EDD.

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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	CAWA-18-150366	1203944649	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203944648	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-150366	1203941752	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-150418	1203941753	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203941751	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-150419	1203940872	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203940871	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203940870	MB	1	0	0	0
EPA:170.0	VOC	CAWA-18-148918	439936001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-148940	439936003	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-18-148943	439936005	FD	1	0	0	0
EPA:170.0	VOC	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-18-150367	439936007	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:170.0	VOC	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-148918	1203947443	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-148918	1203947445	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-18-148918	439936001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-148943	439936004	FD	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203947441	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203947440	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CALA-18-150103	1203940893	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203940892	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203940891	MB	4	0	0	0

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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:310.1	GENERAL CHEMISTRY	CAWA-18-150366	1203941745	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150366	1203941748	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150418	1203941746	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150418	1203941749	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203941744	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-148918	1203938586	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-148918	1203938589	MS	0	0	1	0
EPA:335.4	INORGANIC	CAWA-18-148918	439936001	REG	1	0	0	0
EPA:335.4	INORGANIC	CAWA-18-148943	439936004	FD	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203938584	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203938583	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CALA-18-150103	1203938294	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CALA-18-150103	1203938296	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203937732	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203937731	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148918	1203938300	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148918	1203938302	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148918	439936001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148943	1203938299	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148943	1203938301	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-148943	439936004	FD	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-18-150367	439936008	TEST	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203938298	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203938297	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-150366	1203938312	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203938310	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203938309	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-148944	1203936760	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-148944	1203936761	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-150366	439936006	TEST	1	0	0	0

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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:365.4	GENERAL CHEMISTRY	CAWA-18-150418	439936009	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-18-150419	439936010	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203936759	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203936758	MB	1	0	0	0
EPA:900	RAD	BDW01-18-150415	1203938767	DUP	2	0	0	0
EPA:900	RAD	BDW01-18-150415	1203938768	MS	0	0	2	0
EPA:900	RAD	BDW01-18-150415	1203938769	MSD	0	0	2	0
EPA:900	RAD	CAWA-18-148918	439936001	REG	2	0	0	0
EPA:900	RAD	CAWA-18-148943	439936004	FD	2	0	0	0
EPA:900	RAD	LCS	1203938770	LCS	0	0	2	0
EPA:900	RAD	MB	1203938766	MB	2	0	0	0
EPA:901.1	RAD	CAWA-18-148918	1203938546	DUP	5	0	0	0
EPA:901.1	RAD	CAWA-18-148918	439936001	REG	5	0	0	0
EPA:901.1	RAD	CAWA-18-148943	439936004	FD	5	0	0	0
EPA:901.1	RAD	LCS	1203938547	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203938545	MB	5	0	0	0
EPA:905.0	RAD	BDW01-18-150415	1203938212	DUP	1	0	0	0
EPA:905.0	RAD	BDW01-18-150415	1203938213	MS	0	0	1	0
EPA:905.0	RAD	CAWA-18-148918	439936001	REG	1	0	0	0
EPA:905.0	RAD	CAWA-18-148943	439936004	FD	1	0	0	0
EPA:905.0	RAD	LCS	1203938214	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203938211	MB	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-148918	1203938054	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-148918	439936001	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-18-148943	439936004	FD	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203938055	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203938053	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-148918	1203947538	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-148918	439936001	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-18-148943	439936004	FD	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203947539	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203947537	MB	2	0	0	0
HASL-300:ISOU	RAD	CAWA-18-148918	1203938060	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-148918	439936001	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-18-148943	439936004	FD	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203938061	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203938059	MB	3	0	0	0
SM:A2340B	INORGANIC	CAWA-18-150366	439936006	TEST	1	0	0	0
SM:A2340B	INORGANIC	CAWA-18-150418	439936009	REG	1	0	0	0

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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
SM:A2340B	INORGANIC	CAWA-18-150419	439936010	FD	1	0	0	0
SW-846:6010C	INORGANIC	CALA-18-150103	1203938111	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CALA-18-150103	1203938112	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-18-150366	439936006	TEST	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-150418	439936009	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-18-150419	439936010	FD	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203938110	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203938109	MB	17	0	0	0
SW-846:6020	INORGANIC	CALA-18-150103	1203938140	DUP	10	0	0	0
SW-846:6020	INORGANIC	CALA-18-150103	1203938141	MS	0	0	10	0
SW-846:6020	INORGANIC	CALA-18-150103	1203949449	DUP	1	0	0	0
SW-846:6020	INORGANIC	CALA-18-150103	1203949450	MS	0	0	1	0
SW-846:6020	INORGANIC	CAWA-18-150366	439936006	TEST	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-150418	439936009	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-18-150419	439936010	FD	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203938139	LCS	0	0	10	0
SW-846:6020	INORGANIC	LCS	1203949448	LCS	0	0	1	0
SW-846:6020	INORGANIC	MB	1203938138	MB	10	0	0	0
SW-846:6020	INORGANIC	MB	1203949447	MB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CALA-18-150103	1203940854	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CALA-18-150103	1203940855	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-150366	439936006	TEST	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-150418	439936009	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-18-150419	439936010	FD	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203940853	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203940852	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-18-148918	439936001	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-18-148940	439936003	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-18-148943	439936004	FD	80	3	0	0
SW-846:8260B	VOC	CAWA-18-150367	439936008	TEST	80	3	0	0
SW-846:8260B	VOC	LCS	1203943491	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203943492	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203948056	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203948057	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203943490	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203948055	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-18-148918	1203937916	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-18-148918	1203937917	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-18-148918	439936001	REG	80	6	0	0

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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
SW-846:8270D	SVOC	CAWA-18-148943	439936004	FD	80	6	0	0
SW-846:8270D	SVOC	CAWA-18-150367	439936008	TEST	80	6	0	0
SW-846:8270D	SVOC	LCS	1203937915	LCS	0	6	76	0
SW-846:8270D	SVOC	LCSD	1203937918	LCSD	0	6	76	0
SW-846:8270D	SVOC	MB	1203937914	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-148902	1203938679	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-148902	1203938680	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-148918	439936002	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-148943	439936005	FD	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-18-150367	439936007	TEST	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203938678	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203938677	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-148918	439936001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-148943	439936004	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-148944	1203939350	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-18-150367	439936008	TEST	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203939349	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203939348	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

Field Sample ID	Lab Sample ID	Analytical Method	Sample Date	Extraction Date	Analysis Date	Extraction Hold Time	Max Extract Hold Time	Reject Above	Exceeds Limit	Analysis Hold Time	Max Analysis Hold Time	Reject Above	Exceeds Limit
CAWA-18-148918	439936001	EPA:245.2	12-11-2017		01-08-2018	NA				28	28	29	X
CAWA-18-148943	439936004	EPA:245.2	12-11-2017		01-08-2018	NA				28	28	29	X
CAWA-18-150366	439936006	EPA:245.2	12-11-2017		01-08-2018	NA				28	28	29	X
CAWA-18-150418	439936009	EPA:245.2	12-11-2017		01-08-2018	NA				28	28	29	X
CAWA-18-150419	439936010	EPA:245.2	12-11-2017		01-08-2018	NA				28	28	29	X

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

## DATA VALIDATION REPORT

### 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
MB	1203936758	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0201	J	mg/L	0.050
MB	1203937731	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0403	J	mg/L	0.050
MB	1203938109	METHOD BLANK	SW-846:6010C	W	Sodium	255	J	ug/L	300
CAWA-18-148940	439936003	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-18-150366	1203937731	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0403	mg/L	0.071		0.050	Y	5	100	Y
CAWA-18-150418	1203937731	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0403	mg/L	0.0313	J	0.050	Y	5	100	Y
CAWA-18-150419	1203937731	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0403	mg/L	0.0284	J	0.050	Y	5	100	Y
CAWA-18-150366	1203936758	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0201	mg/L	0.0588		0.050	Y	5	100	Y
CAWA-18-150418	1203936758	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0201	mg/L	0.076		0.050	Y	5	100	Y
CAWA-18-150419	1203936758	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0201	mg/L	0.107		0.050	Y	5	100	Y

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

No.

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

Only results shown in Section 13 'Display Flagged Data' are current as of this report generation. All other sections are valid for the date the COC data was inserted into EIM, and may have changed due to data updates in the intervening time.

## DATA VALIDATION REPORT

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CALA-18-150103	1203938296		EPA:350.1	Ammonia as Nitrogen	1725910	12-14-2017	W	116		110	90	10		
CAWA-18-148918	1203938302		EPA:351.2	Total Kjeldahl Nitrogen	1726142	12-20-2017	W	129		110	90	10		
CAWA-18-148918	1203938302		EPA:351.2	Total Kjeldahl Nitrogen	1726142	12-20-2017	W	129		110	90	10		
CAWA-18-148918	1203938301		EPA:351.2	Total Kjeldahl Nitrogen	1726142	12-20-2017	W	114		110	90	10		
CAWA-18-148943	1203938301		EPA:351.2	Total Kjeldahl Nitrogen	1726142	12-20-2017	W	114		110	90	10		
CAWA-18-148943	1203938301		EPA:351.2	Total Kjeldahl Nitrogen	1726142	12-20-2017	W	114		110	90	10		
CAWA-18-148918	1203937916	1203937917	SW-846:8270D	Benzidine	1725968	12-18-2017	W	11	50	130	15		126	30
CAWA-18-148918	1203937916	1203937917	SW-846:8270D	Pyridine	1725968	12-18-2017	W	22	43	93	24		63	30

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203943491		SW-846:8260B	Dichloroethane[1,2-]	1728172	12-23-2017	W	124		122	74		10		
1203937915	1203937918	SW-846:8270D	Dimethylphenol[2,4-]	1725968	12-17-2017	W	45	55	104	51			20	30

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field Sample ID	Lab Sample ID	LD Lab Sample ID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	LD Lab Result	Lab Units	Detect Flag	LD Detect Flag	RPD	RPD Limit
CAWA-18-148918	439936001	1203938060	HASL-300:ISOU	Uranium-234	W	0.343	0.452	pCi/L	Y	Y	27.5	20

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## DATA VALIDATION REPORT

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00261	pCi/L	0.00261	pCi/L	0.0426	0.00689	W	12/11/2017		1726037	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.0344	pCi/L	-0.0344	pCi/L	4.85	1.36	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.79	pCi/L	1.79	pCi/L	5.07	1.12	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	SVOC	SW-846:8270D	Dimethylphenol[2,4-]	U	UJ	SV12a	N	3.00	ug/L	3.00	ug/L			W	12/11/2017		1725973	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	1.61	pCi/L	1.61	pCi/L	2.81	0.885	W	12/11/2017		1726298	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	1.23	pCi/L	1.23	pCi/L	1.24	0.385	W	12/11/2017		1726298	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-2.31	pCi/L	-2.31	pCi/L	8.30	2.36	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00213	pCi/L	0.00213	pCi/L	0.0429	0.00768	W	12/11/2017		1729763	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00213	pCi/L	-0.00213	pCi/L	0.0462	0.00825	W	12/11/2017		1729763	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	1.4	pCi/L	1.4	pCi/L	68.8	18.2	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.247	pCi/L	0.247	pCi/L	5.15	1.33	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.247	pCi/L	-0.247	pCi/L	0.487	0.110	W	12/11/2017		1726106	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	J+	I6b	Y	0.0535	mg/L	0.0535	mg/L			W	12/11/2017		1726143	VAL	Y
R-68	2018-1240	CAWA-18-148918	REG	INIT	RAD	HASL-300:ISOU	Uranium-234		J	R10	Y	0.343	pCi/L	0.343	pCi/L	0.131	0.032	W	12/11/2017		1726039	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00222	pCi/L	0.00222	pCi/L	0.0363	0.00968	W	12/11/2017		1726037	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	1.74	pCi/L	1.74	pCi/L	4.92	1.44	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	2.99	pCi/L	2.99	pCi/L	5.04	1.83	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	SVOC	SW-846:8270D	Dimethylphenol[2,4-]	U	UJ	SV12a	N	3.09	ug/L	3.09	ug/L			W	12/11/2017		1725973	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	1.77	pCi/L	1.77	pCi/L	2.53	0.854	W	12/11/2017		1726298	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-2.1	pCi/L	-2.1	pCi/L	7.86	2.26	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	-0.01	pCi/L	-0.01	pCi/L	0.0505	0.00709	W	12/11/2017		1729763	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00501	pCi/L	-0.00501	pCi/L	0.0543	0.00709	W	12/11/2017		1729763	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-45	pCi/L	-45	pCi/L	51.2	16.8	W	12/11/2017		1726215	VAL	Y

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## DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.498	pCi/L	-0.498	pCi/L	4.63	1.28	W	12/11/2017		1726215	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.247	pCi/L	-0.247	pCi/L	0.490	0.119	W	12/11/2017		1726106	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	UJ	I6b	N	0.033	mg/L	0.033	mg/L			W	12/11/2017		1726143	VAL	Y
R-68	2018-1240	CAWA-18-148943	FD	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0567	pCi/L	0.0567	pCi/L	0.0739	0.0156	W	12/11/2017		1726039	VAL	Y
R-68	2018-1240	CAWA-18-150366	TEST	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.071	mg/L	0.071	mg/L			W	12/11/2017		1725911	VAL	Y
R-68	2018-1240	CAWA-18-150366	TEST	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0588	mg/L	0.0588	mg/L			W	12/11/2017		1725512	VAL	Y
R-68	2018-1240	CAWA-18-150367	TEST	INIT	SVOC	SW-846:8270D	Dimethylphenol[2,4-]	U	UJ	SV12a	N	3.13	ug/L	3.13	ug/L			W	12/11/2017		1725973	VAL	Y
R-68	2018-1240	CAWA-18-150418	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.0313	mg/L	0.0313	mg/L			W	12/11/2017		1725911	VAL	Y
R-68	2018-1240	CAWA-18-150418	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.076	mg/L	0.076	mg/L			W	12/11/2017		1725512	VAL	Y
R-68	2018-1240	CAWA-18-150419	FD	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.0284	mg/L	0.0284	mg/L			W	12/11/2017		1725911	VAL	Y
R-68	2018-1240	CAWA-18-150419	FD	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		J+	I4a	Y	0.107	mg/L	0.107	mg/L			W	12/11/2017		1725512	VAL	Y

### Reason Code

### Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
I4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5x
I6b	The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample.
R10	Associated duplicate sample has DER or RER> the analytical laboratory's acceptance limits.
R5	Analyte is not detected because the amount reported is less than the MDC.
SV12a	The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.
U_LAB	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-18-148918	R-68	REG	EPA:170.0	0	1

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## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-148918	R-68	REG	EPA:245.2	0	1
CAWA-18-148918	R-68	REG	EPA:335.4	0	1
CAWA-18-148918	R-68	REG	EPA:351.2	0	1
CAWA-18-148918	R-68	REG	EPA:900	0	2
CAWA-18-148918	R-68	REG	EPA:901.1	0	5
CAWA-18-148918	R-68	REG	EPA:905.0	0	1
CAWA-18-148918	R-68	REG	HASL-300:AM-241	0	1
CAWA-18-148918	R-68	REG	HASL-300:ISOPU	0	2
CAWA-18-148918	R-68	REG	HASL-300:ISOU	0	3
CAWA-18-148918	R-68	REG	SW-846:8260B	0	80
CAWA-18-148918	R-68	REG	SW-846:8270D	0	80
CAWA-18-148918	R-68	REG	SW-846:8330B	0	23
CAWA-18-148918	R-68	REG	SW-846:9060	0	1
CAWA-18-148940	R-68	FTB	EPA:170.0	0	1
CAWA-18-148940	R-68	FTB	SW-846:8260B	0	80
CAWA-18-148943	R-68	FD	EPA:170.0	0	1
CAWA-18-148943	R-68	FD	EPA:245.2	0	1
CAWA-18-148943	R-68	FD	EPA:335.4	0	1
CAWA-18-148943	R-68	FD	EPA:351.2	0	1
CAWA-18-148943	R-68	FD	EPA:900	0	2
CAWA-18-148943	R-68	FD	EPA:901.1	0	5
CAWA-18-148943	R-68	FD	EPA:905.0	0	1
CAWA-18-148943	R-68	FD	HASL-300:AM-241	0	1
CAWA-18-148943	R-68	FD	HASL-300:ISOPU	0	2
CAWA-18-148943	R-68	FD	HASL-300:ISOU	0	3
CAWA-18-148943	R-68	FD	SW-846:8260B	0	80
CAWA-18-148943	R-68	FD	SW-846:8270D	0	80
CAWA-18-148943	R-68	FD	SW-846:8330B	0	23
CAWA-18-148943	R-68	FD	SW-846:9060	0	1
CAWA-18-150366	R-68	TEST	EPA:120.1	0	1
CAWA-18-150366	R-68	TEST	EPA:150.1	0	1
CAWA-18-150366	R-68	TEST	EPA:160.1	0	1
CAWA-18-150366	R-68	TEST	EPA:170.0	0	1
CAWA-18-150366	R-68	TEST	EPA:245.2	0	1
CAWA-18-150366	R-68	TEST	EPA:300.0	0	4
CAWA-18-150366	R-68	TEST	EPA:310.1	0	2

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## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-150366	R-68	TEST	EPA:350.1	0	1
CAWA-18-150366	R-68	TEST	EPA:353.2	0	1
CAWA-18-150366	R-68	TEST	EPA:365.4	0	1
CAWA-18-150366	R-68	TEST	SM:A2340B	0	1
CAWA-18-150366	R-68	TEST	SW-846:6010C	0	17
CAWA-18-150366	R-68	TEST	SW-846:6020	0	11
CAWA-18-150366	R-68	TEST	SW-846:6850	0	1
CAWA-18-150367	R-68	TEST	EPA:170.0	0	1
CAWA-18-150367	R-68	TEST	EPA:351.2	0	1
CAWA-18-150367	R-68	TEST	SW-846:8260B	0	80
CAWA-18-150367	R-68	TEST	SW-846:8270D	0	80
CAWA-18-150367	R-68	TEST	SW-846:8330B	0	23
CAWA-18-150367	R-68	TEST	SW-846:9060	0	1
CAWA-18-150418	R-68	REG	EPA:120.1	0	1
CAWA-18-150418	R-68	REG	EPA:150.1	0	1
CAWA-18-150418	R-68	REG	EPA:160.1	0	1
CAWA-18-150418	R-68	REG	EPA:170.0	0	1
CAWA-18-150418	R-68	REG	EPA:245.2	0	1
CAWA-18-150418	R-68	REG	EPA:300.0	0	4
CAWA-18-150418	R-68	REG	EPA:310.1	0	2
CAWA-18-150418	R-68	REG	EPA:350.1	0	1
CAWA-18-150418	R-68	REG	EPA:353.2	0	1
CAWA-18-150418	R-68	REG	EPA:365.4	0	1
CAWA-18-150418	R-68	REG	SM:A2340B	0	1
CAWA-18-150418	R-68	REG	SW-846:6010C	0	17
CAWA-18-150418	R-68	REG	SW-846:6020	0	11
CAWA-18-150418	R-68	REG	SW-846:6850	0	1
CAWA-18-150419	R-68	FD	EPA:120.1	0	1
CAWA-18-150419	R-68	FD	EPA:150.1	0	1
CAWA-18-150419	R-68	FD	EPA:160.1	0	1
CAWA-18-150419	R-68	FD	EPA:170.0	0	1
CAWA-18-150419	R-68	FD	EPA:245.2	0	1
CAWA-18-150419	R-68	FD	EPA:300.0	0	4
CAWA-18-150419	R-68	FD	EPA:310.1	0	2
CAWA-18-150419	R-68	FD	EPA:350.1	0	1
CAWA-18-150419	R-68	FD	EPA:353.2	0	1

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## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-18-150419	R-68	FD	EPA:365.4	0	1
CAWA-18-150419	R-68	FD	SM:A2340B	0	1
CAWA-18-150419	R-68	FD	SW-846:6010C	0	17
CAWA-18-150419	R-68	FD	SW-846:6020	0	11
CAWA-18-150419	R-68	FD	SW-846:6850	0	1

January 09, 2018

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


Re: LANL- WQH Water Samples  
Work Order: 439936  
SDG: 2018-1240

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on December 13, 2017, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. 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,

  
Brielle Luthman for  
Valerie Davis  
Project Manager

Chain of Custody: 2018-1240  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 439936**  
**SDG: 2018-1240**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 439936  
SDG # : 2018-1240**

**January 09, 2018**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on December 13, 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
439936001	CAWA-18-148918
439936002	CAWA-18-148918
439936003	CAWA-18-148940
439936004	CAWA-18-148943
439936005	CAWA-18-148943
439936006	CAWA-18-150366
439936007	CAWA-18-150367
439936008	CAWA-18-150367
439936009	CAWA-18-150418
439936010	CAWA-18-150419

**Case Narrative**

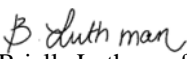
Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**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 Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.



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.

  
Brielle Luthman for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 09 January 2018**

<b>State</b>	<b>Certification</b>
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	LA180011
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	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**





Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <b>ESHL</b>		SDG/AR/COC/Work Order: <b>439936</b>	
Received By: <b>ZKW</b>		Date Received: <b>12/13/17</b>	
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 <b>5908 1783 3231 (32)</b> <b>5908 1783 3253 (42)</b> <b>5908 1783 3220 (20)</b> <b>5908 1783 3242 (20)</b> <b>5908 1783 3210 (14) (Kremer)</b>	
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): <u>0</u> CPM/mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input 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 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 type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs <input type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius      TEMP: <b>See Above</b>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <b>IR3-16</b> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed <b>2437</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken <input checked="" type="checkbox"/> Damaged container <input type="checkbox"/> Leaking container <input type="checkbox"/> Other (describe) <b>one HexP Cont. rec'd broken</b>
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A (If unknown, select No) VOA vials free of headspace? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A Sample ID's and containers affected: <b>-148938 rec'd w/headspace</b>
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input 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 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 type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials **BL** Date **12/14/17** Page **1** of **1**

GL-CHL-SR-001 Rev 5

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

SHIP DATE: 12DEC17  
ACTWGT: 30.0 LB MAN  
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545  
UNITED STATES US

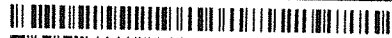
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PDAWE991158W1100



FedEx  
Express



1 of 3

TRK# 5908 1783 3210  
0201

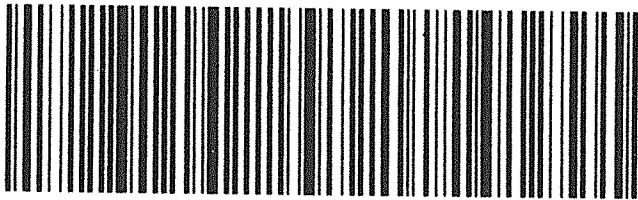
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X7 RBWA

29407

SC-US CHS

WED - 13 DEC 10:30A  
PRIORITY OVERNIGHT



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: 12DEC17  
ACTWGT: 46.0 LB MAN  
CAD: 0014176/CAFE2916

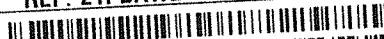
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3 of 3

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0263

Mstr# 5908 1783 3210

0201

X7 RBWA

29407

SC-US CHS

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PRIORITY OVERNIGHT



Part # 135148V-434 RT2 03/15 99

SHIP DATE: 12DEC17  
ACTWGT: 57.0 LB MAN  
CAD: 0014176/CAFE2916

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

LOS ALAMOS, NM 87545  
UNITED STATES US

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
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(843) 556-8171

REF: 21PDAWE991158W1100



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Express



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PRIORITY OVERNIGHT

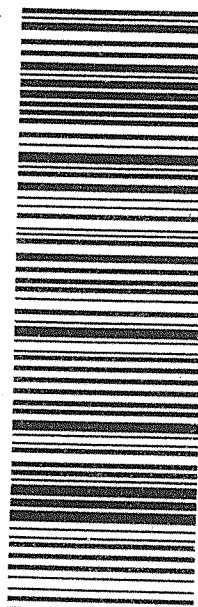
2 of 2

5908 1783 3253

# 5908 1783 3242

7 RBWA

29407  
SC-US CHS



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: 12DEC17  
ACTWGT: 50.0 LB MAN  
CAD: 0014176/CAFE2916

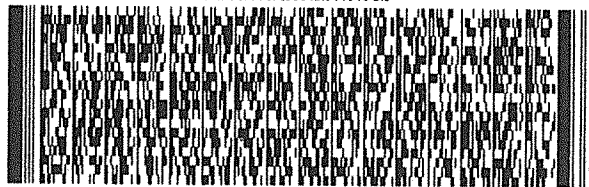
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TO **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

**CHARLESTON SC 29407**

(843) 556-8171

REF: 21PDAWE991158W1100



**FedEx**  
Express



2 of 3

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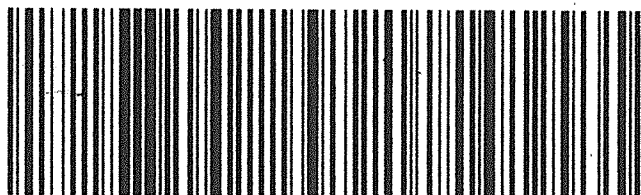
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**PRIORITY OVERNIGHT**

29407

SC-US CHS

**X7 RBWA**



Part # 156148V-434 RIT2 06/15 83

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: 12DEC17  
ACTWGT: 46.0 LB MAN  
CAD: 0014176/CAFE2916

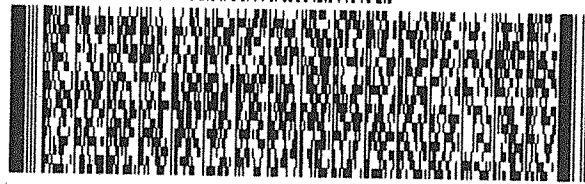
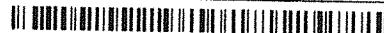
BILL SENDER

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

**CHARLESTON SC 29407**

(843) 556-8171

REF: 21PD0ASRGW04BAGWS0



**FedEx**  
Express



1 of 2

TRK# 5908 1783 3242

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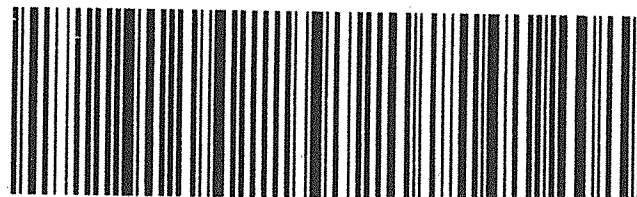
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**WED - 13 DEC 10:30A**  
**PRIORITY OVERNIGHT**

29407

SC-US CH

**X7 RBWA**



Part # 156148V-434 RIT2 06/15 83

# **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 #: 2018-1240  
Work Order #: 439936**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1728172

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936003	CAWA-18-148940
439936004	CAWA-18-148943
439936008	CAWA-18-150367
1203943490	Method Blank (MB)
1203943491	Laboratory Control Sample (LCS)
1203943492	Laboratory Control Sample (LCS)
1203943493	440189010(CALA-18-150423) Post Spike (PS)
1203943494	440189010(CALA-18-150423) Post Spike (PS)
1203943495	440189010(CALA-18-150423) Post Spike Duplicate (PSD)
1203943496	440189010(CALA-18-150423) Post Spike Duplicate (PSD)
1203948055	Method Blank (MB)
1203948056	Laboratory Control Sample (LCS)
1203948057	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/and or LCSD (See Below) recovery was not within the acceptance limits for all analytes. The unacceptable analyte was not detected in the samples associated with the laboratory control sample. Therefore, the data were reported.

Sample	Analyte	Value
1203943491 (LCS)	1, 2-Dichloroethane	124* (74%-122%)

##### **QC Sample Designation**

Spike analyses were not required for this SDG.

##### **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 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>	<b>P &amp; T Trap</b>
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: 2018-1240 GEL Work Order: 439936

#### 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: 09 JAN 2018

Title: Data Validator



# **Sample Data Summary**

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 439936001  
  
**Client ID:** CAWA-18-148918  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:01  
**Prep Date:** 12/23/2017 21:01  
**Data File:** 122317V1\1N615.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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:** 2018-1240  
**Lab Sample ID:** 439936001  
  
**Client ID:** CAWA-18-148918  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:01  
**Prep Date:** 12/23/2017 21:01  
**Data File:** 122317V1\1N615.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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**

SDG Number: 2018-1240

Lab Sample ID: 439936001

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1728172

Inst: VOA1.I

Dilution: 1

Run Date: 12/23/2017 21:01

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 12/23/2017 21:01

Data File: 122317V1\1N615.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	49.6	50.0	ug/L 99	(71%-134%)
Bromofluorobenzene	58.5	50.0	ug/L 117	(70%-131%)
Toluene-d8	43.1	50.0	ug/L 86	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	8.241	86.4	ug/L	0	J
	unknown siloxane	14.549	13.9	ug/L	0	J
	unknown	19.021	16.1	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 439936003  
  
**Client ID:** CAWA-18-148940  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:30  
**Prep Date:** 12/23/2017 21:30  
**Data File:** 122317V1\1N616.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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:** 2018-1240  
**Lab Sample ID:** 439936003  
  
**Client ID:** CAWA-18-148940  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:30  
**Prep Date:** 12/23/2017 21:30  
**Data File:** 122317V1\1N616.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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**

SDG Number: 2018-1240

Lab Sample ID: 439936003

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1728172

Inst: VOA1.I

Dilution: 1

Run Date: 12/23/2017 21:30

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 12/23/2017 21:30

Data File: 122317V1\1N616.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	48.9	50.0	ug/L 98	(71%-134%)
Bromofluorobenzene	58.5	50.0	ug/L 117	(70%-131%)
Toluene-d8	44.0	50.0	ug/L 88	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	10.3	86.7	ug/L	0	J
	unknown siloxane	14.549	12.8	ug/L	0	J
	unknown	19.021	17.4	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 439936004  
  
**Client ID:** CAWA-18-148943  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:59  
**Prep Date:** 12/23/2017 21:59  
**Data File:** 122317V1\1N617.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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:** 2018-1240  
**Lab Sample ID:** 439936004  
  
**Client ID:** CAWA-18-148943  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:59  
**Prep Date:** 12/23/2017 21:59  
**Data File:** 122317V1\1N617.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 439936004  
  
**Client ID:** CAWA-18-148943  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 21:59  
**Prep Date:** 12/23/2017 21:59  
**Data File:** 122317V1\1N617.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 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
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	48.0	50.0	ug/L 96	(71%-134%)
Bromofluorobenzene	58.5	50.0	ug/L 117	(70%-131%)
Toluene-d8	42.9	50.0	ug/L 86	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	8.241	87.2	ug/L	0	J
	unknown siloxane	14.549	12.8	ug/L	0	J
	unknown	19.021	14.9	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 3

SDG Number: 2018-1240

Lab Sample ID: 439936008

Date Collected: 12/11/2017 10:56

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-150367

Batch ID: 1728172

Run Date: 12/23/2017 22:28

Prep Date: 12/23/2017 22:28

Data File: 122317V1\1N618.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:** 2018-1240  
**Lab Sample ID:** 439936008  
  
**Client ID:** CAWA-18-150367  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 22:28  
**Prep Date:** 12/23/2017 22:28  
**Data File:** 122317V1\1N618.D

**Date Collected:** 12/11/2017 10:56  
**Date Received:** 12/13/2017 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**

SDG Number: 2018-1240

Lab Sample ID: 439936008

Date Collected: 12/11/2017 10:56

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1728172

Inst: VOA1.I

Dilution: 1

Run Date: 12/23/2017 22:28

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 12/23/2017 22:28

Data File: 122317V1\1N618.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	48.5	50.0	ug/L 97	(71%-134%)
Bromofluorobenzene	58.6	50.0	ug/L 117	(70%-131%)
Toluene-d8	43.5	50.0	ug/L 87	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	8.259	86.8	ug/L	0	J
	unknown siloxane	14.549	14.3	ug/L	0	J
	unknown	19.021	18.1	ug/L	0	J

# **Quality Control Summary**

**Volatile**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2018-1240****Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203943491	LCS for batch 1728172	96	87	104
1203943492	LCS for batch 1728172	93	85	105
1203943490	MB for batch 1728172	95	87	112
439936001	CAWA-18-148918	99	86	117
439936003	CAWA-18-148940	98	88	117
439936004	CAWA-18-148943	96	86	117
439936008	CAWA-18-150367	97	87	117
1203948056	LCS for batch 1728172	88	82	105
1203948057	LCS for batch 1728172	87	83	108
1203948055	MB for batch 1728172	89	85	116
1203943493	CALA-18-150423PS	88	83	105
1203943495	CALA-18-150423PSD	86	84	108
1203943494	CALA-18-150423PS	86	84	108
1203943496	CALA-18-150423PSD	83	82	106

**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: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203943491

Instrument: VOA1.I

Analysis Date: 12/23/2017 15:13

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	101	101	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1440	115	61-125
67-64-1	LCS Acetone	250	0.0	299	119	48-157
74-88-4	LCS Iodomethane	250	0.0	288	115	72-128
75-15-0	LCS Carbon disulfide	250	0.0	272	109	69-138
108-05-4	LCS Vinyl acetate	250	0.0	246	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	279	112	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	246	98	66-124
591-78-6	LCS 2-Hexanone	250	0.0	326	130	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	55.6	111	40-160
74-87-3	LCS Chloromethane	50.0	0.0	47.9	96	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	51.8	104	65-137
74-83-9	LCS Bromomethane	50.0	0.0	58.1	116	63-137
75-00-3	LCS Chloroethane	50.0	0.0	54.2	108	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	62.1	124	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	54.2	108	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	59.9	120	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	53.3	107	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	51.6	103	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	60.1	120	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	58.1	116	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	58.3	117	75-123



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203943491

Instrument: VOA1.I

Analysis Date: 12/23/2017 15:13

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	59.9	120	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	59.2	118	76-125
67-66-3	LCS Chloroform	50.0	0.0	59.4	119	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	62.3	125	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	56.9	114	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	65.5	131	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	61.8	124 *	74-122
71-43-2	LCS Benzene	50.0	0.0	54.2	108	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	60.3	121	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	55.9	112	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	59.6	119	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	61.4	123	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	55.1	110	78-131
108-88-3	LCS Toluene	50.0	0.0	48.9	98	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	52.0	104	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	51.7	103	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	49.6	99	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	54.2	108	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	56.7	113	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	53.4	107	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	49.5	99	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	49.4	99	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

SDG Number: 2018-1240

Client ID: LCS for batch 1728172

Lab Sample ID 1203943491

Instrument: VOA1.I

Analyst: PXY1

Purge Vol: 5 mL

Sample Type: Laboratory Control Sample

Matrix: WATER

Analysis Date: 12/23/2017 15:13

Dilution: 1

Batch ID: 1728172

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	50.2	100	74-126
100-42-5	LCS Styrene	50.0	0.0	49.2	98	72-130
75-25-2	LCS Bromoform	50.0	0.0	54.5	109	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	45.6	91	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	46.7	93	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	52.7	105	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	48.7	97	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	45.7	91	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.5	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	47.8	96	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	46.7	93	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	48.4	97	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.7	93	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.6	93	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.2	94	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	47.4	95	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	48.3	97	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	47.6	95	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	53.4	107	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	55.4	111	72-136
91-20-3	LCS Naphthalene	50.0	0.0	57.2	114	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	58.5	117	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203943491

Instrument: VOA1.I

Analysis Date: 12/23/2017 15:13

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	54.9	110	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	55.1	110	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	48.5	97	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5920	118	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203943492

Instrument: VOA1.I

Analysis Date: 12/23/2017 16:10

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	266	106	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	293	117	61-148
107-05-1	LCS	Allyl chloride	250	0.0	264	106	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	279	112	65-122
107-12-0	LCS	Propionitrile	250	0.0	267	107	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	276	111	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	266	107	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	220	88	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2730	109	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	53.5	107	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike

Client ID: CALA-18-150423PS

Matrix: W

Lab Sample ID 1203943493

Instrument: VOA1.I

Analysis Date: 12/26/2017 19:41

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	85.6	86	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1310	104	56-131
67-64-1	PS Acetone	250	0.00 U	119	48	25-155
74-88-4	PS Iodomethane	250	0.00 U	262	105	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	227	91	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	254	102	48-133
78-93-3	PS 2-Butanone	250	0.00 U	150	60	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	207	83	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	186	74	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	60.1	120	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	52.7	105	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	52.3	105	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	62.4	125	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	53.7	107	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	58.5	117	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	57.1	114	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	48.9	98	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	49.8	100	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	47.6	95	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	51.9	104	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	52.1	104	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.6	107	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1240

Sample Type: Post Spike

Client ID: CALA-18-150423PS

Matrix: W

Lab Sample ID 1203943493

Instrument: VOA1.I

Analysis Date: 12/26/2017 19:41

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	50.3	101	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	56.3	113	71-130
67-66-3	PS Chloroform	50.0	0.00 U	55.2	110	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	52.2	104	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	46.9	94	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	54.8	110	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	59.0	118	69-130
71-43-2	PS Benzene	50.0	0.00 U	47.9	96	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	52.2	104	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	52.0	104	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	56.7	113	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	57.5	115	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	50.9	102	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.9	84	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	46.8	94	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	47.3	95	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	46.0	92	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	44.4	89	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	52.8	106	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	49.1	98	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	44.4	89	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.1	84	61-130

**Volatile**  
**Quality Control Summary**  
**Spike Recovery Report**

SDG Number: 2018-1240

Sample Type: Post Spike

Client ID: CALA-18-150423PS

Matrix: W

Lab Sample ID 1203943493

Instrument: VOA1.I

Analysis Date: 12/26/2017 19:41

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	43.9	88	62-131
100-42-5	PS Styrene	50.0	0.00 U	44.2	88	59-135
75-25-2	PS Bromoform	50.0	0.00 U	49.4	99	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	37.9	76	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	42.0	84	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	46.9	94	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	43.6	87	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	37.5	75	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	39.8	80	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	40.0	80	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	39.6	79	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	40.6	81	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	38.4	77	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	39.2	78	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	41.6	83	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	42.8	86	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	38.4	77	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	46.2	92	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	44.8	90	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	48.7	97	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	50.0	100	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike

Client ID: CALA-18-150423PS

Matrix: W

Lab Sample ID 1203943493

Instrument: VOA1.I

Analysis Date: 12/26/2017 19:41

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS	1,2,4-Trichlorobenzene	50.0	0.00	U	46.4	93	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	51.3	103	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	43.7	87	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	5410	108	60-140



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike Duplicate

Client ID: CALA-18-150423PSD

Matrix: W

Lab Sample ID 1203943495

Instrument: VOA1.I

Analysis Date: 12/26/2017 20:10

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	85.2	85	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1300	104	56-131	0	0-20
67-64-1	PSD Acetone	250	0.00 U	121	48	25-155	1	0-20
74-88-4	PSD Iodomethane	250	0.00 U	252	101	66-133	4	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	217	87	61-141	5	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	244	98	48-133	4	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	151	61	25-143	1	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	213	85	61-127	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	194	78	33-138	4	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	57.4	115	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	50.4	101	53-139	4	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	47.4	95	58-140	10	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	60.4	121	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	52.0	104	65-129	3	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	55.8	112	65-141	5	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	56.5	113	69-127	1	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	46.7	93	59-130	5	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	48.8	98	62-123	2	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	47.7	95	69-132	0	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	50.5	101	65-127	3	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	50.3	101	67-127	3	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	52.1	104	69-127	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike Duplicate

Client ID: CALA-18-150423PSD

Matrix: W

Lab Sample ID 1203943495

Instrument: VOA1.I

Analysis Date: 12/26/2017 20:10

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00	U 47.7	95	66-137	5	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 54.9	110	71-130	3	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 53.3	107	71-129	4	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 49.9	100	69-139	4	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 44.7	89	67-130	5	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 52.1	104	66-143	5	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 57.0	114	69-130	3	0-20
71-43-2	PSD Benzene	50.0	0.00	U 46.8	94	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 50.1	100	65-131	4	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 50.2	100	67-127	4	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 56.0	112	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 56.1	112	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 49.0	98	70-134	4	0-20
108-88-3	PSD Toluene	50.0	0.00	U 42.6	85	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 47.4	95	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 48.3	97	66-125	2	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 46.9	94	67-124	2	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 44.1	88	60-130	1	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 53.3	107	68-143	1	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 49.9	100	71-127	2	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 44.6	89	64-124	0	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 42.4	85	61-130	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike Duplicate

Client ID: CALA-18-150423PSD

Matrix: W

Lab Sample ID 1203943495

Instrument: VOA1.I

Analysis Date: 12/26/2017 20:10

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00	U 43.3	87	62-131	1	0-20
100-42-5	PSD Styrene	50.0	0.00	U 43.9	88	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 51.4	103	64-138	4	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 38.1	76	55-133	1	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 44.1	88	62-129	5	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 49.0	98	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 44.1	88	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 37.0	74	50-133	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 39.3	79	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 41.0	82	56-128	0	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 40.2	80	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 39.9	80	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 40.5	81	53-132	0	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 37.9	76	50-138	1	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 38.5	77	49-138	2	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 42.0	84	56-126	1	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 42.2	84	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 37.4	75	43-142	3	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 48.3	97	62-141	5	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 43.5	87	40-147	3	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 49.6	99	62-134	2	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	U 49.4	99	52-135	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Post Spike Duplicate

Client ID: CALA-18-150423PSD

Matrix: W

Lab Sample ID 1203943495

Instrument: VOA1.I

Analysis Date: 12/26/2017 20:10

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	45.4	91	50-133	2	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	50.6	101	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	43.5	87	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	5460	109	60-140	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-1240

Sample Type: Post Spike

Client ID: CALA-18-150423PS

Matrix: W

Lab Sample ID 1203943494

Instrument: VOA1.I

Analysis Date: 12/26/2017 20:39

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS	Acrolein	250	0.00	U	238	95	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	243	97	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	244	97	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	257	103	59-129
107-12-0	PS	Propionitrile	250	0.00	U	244	97	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	255	102	59-134
80-62-6	PS	Methyl methacrylate	250	0.00	U	251	101	62-135
97-63-2	PS	Ethyl methacrylate	250	0.00	U	206	82	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2370	95	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	46.5	93	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2018-1240

Sample Type: Post Spike Duplicate

Client ID: CALA-18-150423PSD

Matrix: W

Lab Sample ID 1203943496

Instrument: VOA1.I

Analysis Date: 12/26/2017 21:08

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	229	91	49-141	4	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	233	93	57-149	4	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	237	95	54-128	3	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	254	102	59-129	1	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	239	95	58-131	2	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	248	99	59-134	3	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	243	97	62-135	3	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	204	82	60-136	1	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2370	95	60-143	0	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	45.6	91	63-146	2	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203948056

Instrument: VOA1.I

Analysis Date: 12/26/2017 10:36

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	95.3	95	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1310	105	61-125
67-64-1	LCS Acetone	250	0.0	294	118	48-157
74-88-4	LCS Iodomethane	250	0.0	279	111	72-128
75-15-0	LCS Carbon disulfide	250	0.0	252	101	69-138
108-05-4	LCS Vinyl acetate	250	0.0	285	114	67-125
78-93-3	LCS 2-Butanone	250	0.0	269	108	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	225	90	66-124
591-78-6	LCS 2-Hexanone	250	0.0	299	120	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	71.8	144	40-160
74-87-3	LCS Chloromethane	50.0	0.0	56.4	113	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	57.8	116	65-137
74-83-9	LCS Bromomethane	50.0	0.0	66.2	132	63-137
75-00-3	LCS Chloroethane	50.0	0.0	60.0	120	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	67.0	134	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	58.2	116	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	56.1	112	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	50.7	101	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	49.4	99	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	57.4	115	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	56.0	112	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	56.0	112	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203948056

Instrument: VOA1.I

Analysis Date: 12/26/2017 10:36

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	57.3	115	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	56.6	113	76-125
67-66-3	LCS Chloroform	50.0	0.0	58.1	116	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	59.1	118	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	53.9	108	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	62.8	126	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	59.9	120	74-122
71-43-2	LCS Benzene	50.0	0.0	51.9	104	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	57.6	115	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	54.2	108	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	57.5	115	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	59.7	119	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.2	106	78-131
108-88-3	LCS Toluene	50.0	0.0	46.5	93	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	48.5	97	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	48.8	98	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	46.9	94	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	51.6	103	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	54.1	108	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	50.6	101	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	47.8	96	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	46.8	94	73-125



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203948056

Instrument: VOA1.I

Analysis Date: 12/26/2017 10:36

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	47.4	95	74-126
100-42-5	LCS Styrene	50.0	0.0	46.7	93	72-130
75-25-2	LCS Bromoform	50.0	0.0	51.4	103	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	43.5	87	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	43.5	87	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	49.0	98	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	46.7	93	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	43.3	87	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	44.6	89	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	45.2	90	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.1	88	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.2	92	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	44.6	89	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	44.3	89	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	45.5	91	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	45.9	92	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	46.9	94	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.9	90	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	48.9	98	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	53.3	107	72-136
91-20-3	LCS Naphthalene	50.0	0.0	52.2	104	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	54.4	109	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203948056

Instrument: VOA1.I

Analysis Date: 12/26/2017 10:36

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	51.0	102	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	53.6	107	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	46.6	93	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5350	107	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1728172

Matrix: WATER

Lab Sample ID 1203948057

Instrument: VOA1.I

Analysis Date: 12/26/2017 12:02

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1728172

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	266	107	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	269	107	61-148
107-05-1	LCS	Allyl chloride	250	0.0	257	103	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	266	106	65-122
107-12-0	LCS	Propionitrile	250	0.0	251	100	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	267	107	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	257	103	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	211	85	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2500	100	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	50.0	100	66-147

## Method Blank Summary

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SDG Number:	2018-1240	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1728172	Instrument ID:	VOA1.I	Data File:	122317V1\1N606A.D
Lab Sample ID:	1203943490	Prep Date:	12/23/2017 16:39	Analyzed:	12/23/17 16:39
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 1728172	1203943491	122317V1\1N603A.D	12/23/17	1513
02 LCS for batch 1728172	1203943492	122317V1\1N605A.D	12/23/17	1610
03 CAWA-18-148918	439936001	122317V1\1N615.D	12/23/17	2101
04 CAWA-18-148940	439936003	122317V1\1N616.D	12/23/17	2130
05 CAWA-18-148943	439936004	122317V1\1N617.D	12/23/17	2159
06 CAWA-18-150367	439936008	122317V1\1N618.D	12/23/17	2228

## Method Blank Summary

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SDG Number:	2018-1240	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1728172	Instrument ID:	VOA1.I	Data File:	122617V1\1O108A.D
Lab Sample ID:	1203948055	Prep Date:	12/26/2017 13:00	Analyzed:	12/26/17 13:00
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 1728172	1203948056	122617V1\1O103A.D	12/26/17	1036
09 LCS for batch 1728172	1203948057	122617V1\1O106A.D	12/26/17	1202
10 CALA-18-150423PS	1203943493	122617V1\1O122.D	12/26/17	1941
11 CALA-18-150423PSD	1203943495	122617V1\1O123.D	12/26/17	2010
12 CALA-18-150423PS	1203943494	122617V1\1O124.D	12/26/17	2039
13 CALA-18-150423PSD	1203943496	122617V1\1O125.D	12/26/17	2108

# Quality Control Data

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943490  
**Client Sample:** QC for batch 1728172  
**Client ID:** MB for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:39  
**Prep Date:** 12/23/2017 16:39  
**Data File:** 122317V1\1N606A.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:** 2018-1240  
**Lab Sample ID:** 1203943490  
**Client Sample:** QC for batch 1728172  
**Client ID:** MB for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:39  
**Prep Date:** 12/23/2017 16:39  
**Data File:** 122317V1\1N606A.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	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:** 2018-1240  
**Lab Sample ID:** 1203943490  
**Client Sample:** QC for batch 1728172  
**Client ID:** MB for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:39  
**Prep Date:** 12/23/2017 16:39  
**Data File:** 122317V1\1N606A.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
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	47.4	50.0	ug/L 95	(71%-134%)
Bromofluorobenzene	56.1	50.0	ug/L 112	(70%-131%)
Toluene-d8	43.5	50.0	ug/L 87	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	8.241	97.5	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 3

SDG Number: 2018-1240

Lab Sample ID: 1203943491

Client Sample: QC for batch 1728172

Client ID: LCS for batch 1728172

Batch ID: 1728172

Run Date: 12/23/2017 15:13

Prep Date: 12/23/2017 15:13

Data File: 122317V1\1N603A.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		55.1	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		62.3	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		46.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		58.1	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		59.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		56.9	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		52.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		54.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		53.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		53.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.5	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		61.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		55.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		47.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.6	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		48.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		59.9	ug/L	0.300	1.00
78-93-3	2-Butanone		279	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		47.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		326	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		46.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		246	ug/L	1.50	5.00
67-64-1	Acetone		299	ug/L	1.50	10.0
75-05-8	Acetonitrile		1440	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		54.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.7	ug/L	0.300	1.00
74-97-5	Bromochloromethane		59.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		61.4	ug/L	0.300	1.00
75-25-2	Bromoform		54.5	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943491  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 15:13  
**Prep Date:** 12/23/2017 15:13  
**Data File:** 122317V1\1N603A.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		58.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		272	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		65.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.5	ug/L	0.300	1.00
75-00-3	Chloroethane		54.2	ug/L	0.300	1.00
67-66-3	Chloroform		59.4	ug/L	0.300	1.00
74-87-3	Chloromethane		47.9	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		56.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		59.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		55.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		54.2	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		49.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		55.4	ug/L	0.300	1.00
74-88-4	Iodomethane		288	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.6	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		53.3	ug/L	1.00	10.0
91-20-3	Naphthalene		57.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		54.2	ug/L	0.300	1.00
108-88-3	Toluene		48.9	ug/L	0.300	1.00
79-01-6	Trichloroethylene		60.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		62.1	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		51.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		58.3	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		55.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		101	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5920	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		47.6	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.7	ug/L	0.300	1.00
95-47-6	o-Xylene		50.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.6	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943491  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 15:13  
**Prep Date:** 12/23/2017 15:13  
**Data File:** 122317V1\1N603A.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
1634-04-4	tert-Butyl methyl ether		51.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		48.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		60.1	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		52.0	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	ug/L	96	(71%-134%)
Bromofluorobenzene	52.0	50.0	ug/L	104	(70%-131%)
Toluene-d8	43.4	50.0	ug/L	87	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943492  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:10  
**Prep Date:** 12/23/2017 16:10  
**Data File:** 122317V1\1N605A.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		53.5	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		266	ug/L	1.50	5.00
107-13-1	Acrylonitrile		279	ug/L	1.50	5.00
107-05-1	Allyl chloride		264	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:** 2018-1240  
**Lab Sample ID:** 1203943492  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:10  
**Prep Date:** 12/23/2017 16:10  
**Data File:** 122317V1\1N605A.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	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		220	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		2730	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		276	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		266	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		267	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		293	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:** 2018-1240  
**Lab Sample ID:** 1203943492  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/23/2017 16:10  
**Prep Date:** 12/23/2017 16:10  
**Data File:** 122317V1\1N605A.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
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	46.3	50.0	ug/L 93	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	42.6	50.0	ug/L 85	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 3

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943493  
**Client Sample:** QC for batch 1728172  
**Client ID:** CALA-18-150423PS  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 19:41  
**Prep Date:** 12/26/2017 19:41  
**Data File:** 122617V1\10122.D

**Date Collected:** 12/13/2017 11:12  
**Date Received:** 12/15/2017 09:05  
**Client:** ARSL004  
**Method:** SW-846:8260B  
**Inst:** VOA1.I  
**Analyst:** PXY1  
  
**Column:** DB-624

**Matrix:** W  
  
**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		51.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		42.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		47.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.1	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		48.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.0	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		46.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		46.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		40.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		46.2	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		49.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		43.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		59.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		52.0	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		39.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		41.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		46.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		50.3	ug/L	0.300	1.00
78-93-3	2-Butanone		150	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		40.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		186	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		40.0	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		39.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		207	ug/L	1.50	5.00
67-64-1	Acetone		119	ug/L	1.50	10.0
75-05-8	Acetonitrile		1310	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		47.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.6	ug/L	0.300	1.00
74-97-5	Bromochloromethane		56.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		57.5	ug/L	0.300	1.00
75-25-2	Bromoform		49.4	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2018-1240	<b>Date Collected:</b> 12/13/2017 11:12	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203943493	<b>Date Received:</b> 12/15/2017 09:05	
<b>Client Sample:</b> QC for batch 1728172	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CALA-18-150423PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1728172	<b>Inst:</b> VOA1.I	<b>Dilution:</b> 1
<b>Run Date:</b> 12/26/2017 19:41	<b>Analyst:</b> PXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 12/26/2017 19:41		
<b>Data File:</b> 122617V1\10122.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		62.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		227	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		54.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		44.4	ug/L	0.300	1.00
75-00-3	Chloroethane		53.7	ug/L	0.300	1.00
67-66-3	Chloroform		55.2	ug/L	0.300	1.00
74-87-3	Chloromethane		52.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.8	ug/L	0.300	1.00
74-95-3	Dibromomethane		56.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		60.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		57.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		44.8	ug/L	0.300	1.00
74-88-4	Iodomethane		262	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		37.9	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		49.8	ug/L	1.00	10.0
91-20-3	Naphthalene		48.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		44.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		44.4	ug/L	0.300	1.00
108-88-3	Toluene		41.9	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.2	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		58.5	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		254	ug/L	1.50	5.00
75-01-4	Vinyl chloride		52.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		50.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		85.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5410	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		38.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		37.5	ug/L	0.300	1.00
95-47-6	o-Xylene		43.9	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		38.4	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	<b>2018-1240</b>	<b>Date Collected:</b>	<b>12/13/2017 11:12</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203943493</b>	<b>Date Received:</b>	<b>12/15/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1728172</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CALA-18-150423PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1728172</b>	<b>Inst:</b>	<b>VOA1.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>12/26/2017 19:41</b>	<b>Analyst:</b>	<b>PXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>12/26/2017 19:41</b>				
<b>Data File:</b>	<b>122617V1\10122.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		47.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		39.6	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		51.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		46.8	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.2	50.0	ug/L	88	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L	105	(70%-131%)
Toluene-d8	41.5	50.0	ug/L	83	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943494  
**Client Sample:** QC for batch 1728172  
**Client ID:** CALA-18-150423PS  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 20:39  
**Prep Date:** 12/26/2017 20:39  
**Data File:** 122617V1\10124.D

**Date Collected:** 12/13/2017 11:12  
**Date Received:** 12/15/2017 09:05  
**Client:** ARSL004  
**Method:** SW-846:8260B  
**Inst:** VOA1.I  
**Analyst:** PXY1  
  
**Column:** DB-624

**Matrix:** W  
  
**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		46.5	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		238	ug/L	1.50	5.00
107-13-1	Acrylonitrile		257	ug/L	1.50	5.00
107-05-1	Allyl chloride		244	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:** 2018-1240  
**Lab Sample ID:** 1203943494  
**Client Sample:** QC for batch 1728172  
**Client ID:** CALA-18-150423PS  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 20:39  
**Prep Date:** 12/26/2017 20:39  
**Data File:** 122617V1\10124.D

**Date Collected:** 12/13/2017 11:12  
**Date Received:** 12/15/2017 09:05  
**Client:** ARSL004  
**Method:** SW-846:8260B  
**Inst:** VOA1.I  
**Analyst:** PXY1  
  
**Column:** DB-624

**Matrix:** W  
  
**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		206	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		2370	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		255	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		251	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		244	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		243	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:	2018-1240	Date Collected:	12/13/2017 11:12	Matrix:	W
Lab Sample ID:	1203943494	Date Received:	12/15/2017 09:05		
Client Sample:	QC for batch 1728172	Client:	ARSL004	Project:	QC
Client ID:	CALA-18-150423PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1728172	Inst:	VOA1.I	Dilution:	1
Run Date:	12/26/2017 20:39	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	12/26/2017 20:39				
Data File:	122617V1\10124.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	43.1	50.0	ug/L	86	(71%-134%)
Bromofluorobenzene	54.0	50.0	ug/L	108	(70%-131%)
Toluene-d8	41.9	50.0	ug/L	84	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2018-1240	<b>Date Collected:</b> 12/13/2017 11:12	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203943495	<b>Date Received:</b> 12/15/2017 09:05	
<b>Client Sample:</b> QC for batch 1728172	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CALA-18-150423PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1728172	<b>Inst:</b> VOA1.I	<b>Dilution:</b> 1
<b>Run Date:</b> 12/26/2017 20:10	<b>Analyst:</b> PXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 12/26/2017 20:10		
<b>Data File:</b> 122617V1\10123.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		50.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		44.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		50.3	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		44.7	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		49.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		45.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		40.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		48.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		49.9	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		43.5	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		57.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		39.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		42.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		46.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.7	ug/L	0.300	1.00
78-93-3	2-Butanone		151	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		41.0	ug/L	0.300	1.00
591-78-6	2-Hexanone		194	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		40.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		38.5	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		213	ug/L	1.50	5.00
67-64-1	Acetone		121	ug/L	1.50	10.0
75-05-8	Acetonitrile		1300	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		46.8	ug/L	0.300	1.00
108-86-1	Bromobenzene		44.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		54.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		56.1	ug/L	0.300	1.00
75-25-2	Bromoform		51.4	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2018-1240	<b>Date Collected:</b> 12/13/2017 11:12	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203943495	<b>Date Received:</b> 12/15/2017 09:05	
<b>Client Sample:</b> QC for batch 1728172	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CALA-18-150423PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1728172	<b>Inst:</b> VOA1.I	<b>Dilution:</b> 1
<b>Run Date:</b> 12/26/2017 20:10	<b>Analyst:</b> PXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 12/26/2017 20:10		
<b>Data File:</b> 122617V1\10123.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		60.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		217	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene		44.6	ug/L	0.300	1.00
75-00-3	Chloroethane		52.0	ug/L	0.300	1.00
67-66-3	Chloroform		53.3	ug/L	0.300	1.00
74-87-3	Chloromethane		50.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		56.0	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		57.4	ug/L	0.300	1.00
60-29-7	Ethyl ether		56.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		252	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		38.1	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		48.8	ug/L	1.00	10.0
91-20-3	Naphthalene		49.6	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		43.9	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		44.1	ug/L	0.300	1.00
108-88-3	Toluene		42.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		55.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		244	ug/L	1.50	5.00
75-01-4	Vinyl chloride		47.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		52.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.0	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		85.2	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5460	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		37.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		37.0	ug/L	0.300	1.00
95-47-6	o-Xylene		43.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		37.9	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

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<b>SDG Number:</b>	<b>2018-1240</b>	<b>Date Collected:</b>	<b>12/13/2017 11:12</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203943495</b>	<b>Date Received:</b>	<b>12/15/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1728172</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CALA-18-150423PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1728172</b>	<b>Inst:</b>	<b>VOA1.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>12/26/2017 20:10</b>	<b>Analyst:</b>	<b>PXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>12/26/2017 20:10</b>				
<b>Data File:</b>	<b>122617V1\10123.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		47.7	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		39.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		50.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		47.4	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	43.1	50.0	ug/L	86	(71%-134%)
Bromofluorobenzene	53.8	50.0	ug/L	108	(70%-131%)
Toluene-d8	41.9	50.0	ug/L	84	(74%-124%)



**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203943496  
**Client Sample:** QC for batch 1728172  
**Client ID:** CALA-18-150423PSD  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 21:08  
**Prep Date:** 12/26/2017 21:08  
**Data File:** 122617V1\10125.D

**Date Collected:** 12/13/2017 11:12  
**Date Received:** 12/15/2017 09:05  
**Client:** ARSL004  
**Method:** SW-846:8260B  
**Inst:** VOA1.I  
**Analyst:** PXY1  
  
**Column:** DB-624

**Matrix:** W  
  
**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		45.6	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		229	ug/L	1.50	5.00
107-13-1	Acrylonitrile		254	ug/L	1.50	5.00
107-05-1	Allyl chloride		237	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**

<b>SDG Number:</b>	<b>2018-1240</b>	<b>Date Collected:</b>	<b>12/13/2017 11:12</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203943496</b>	<b>Date Received:</b>	<b>12/15/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1728172</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CALA-18-150423PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1728172</b>	<b>Inst:</b>	<b>VOA1.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>12/26/2017 21:08</b>	<b>Analyst:</b>	<b>PXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>12/26/2017 21:08</b>				
<b>Data File:</b>	<b>122617V1\10125.D</b>	<b>Column:</b>	<b>DB-624</b>		

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		204	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		2370	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		248	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		239	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		233	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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<b>SDG Number:</b> 2018-1240	<b>Date Collected:</b> 12/13/2017 11:12	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203943496	<b>Date Received:</b> 12/15/2017 09:05	
<b>Client Sample:</b> QC for batch 1728172	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CALA-18-150423PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1728172	<b>Inst:</b> VOA1.I	<b>Dilution:</b> 1
<b>Run Date:</b> 12/26/2017 21:08	<b>Analyst:</b> PXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 12/26/2017 21:08		
<b>Data File:</b> 122617V1\10125.D	<b>Column:</b> 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	41.7	50.0	ug/L 83	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	41.1	50.0	ug/L 82	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203948055  
**Client Sample:** QC for batch 1728172  
**Client ID:** MB for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 13:00  
**Prep Date:** 12/26/2017 13:00  
**Data File:** 122617V1\1O108A.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:** 2018-1240  
**Lab Sample ID:** 1203948055  
**Client Sample:** QC for batch 1728172  
**Client ID:** MB for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 13:00  
**Prep Date:** 12/26/2017 13:00  
**Data File:** 122617V1\1O108A.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	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: 2018-1240

Lab Sample ID: 1203948055

Client Sample: QC for batch 1728172

Client ID: MB for batch 1728172

Batch ID: 1728172

Run Date: 12/26/2017 13:00

Prep Date: 12/26/2017 13:00

Data File: 122617V1\1O108A.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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
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	44.3	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	58.0	50.0	ug/L 116	(70%-131%)
Toluene-d8	42.4	50.0	ug/L 85	(74%-124%)

## Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	6.023	73.1	ug/L	0	J
	unknown	10.929	6.95	ug/L	0	J
	unknown siloxane	14.549	7.7	ug/L	0	J

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 3

SDG Number: 2018-1240

Lab Sample ID: 1203948056

Client Sample: QC for batch 1728172

Client ID: LCS for batch 1728172

Batch ID: 1728172

Run Date: 12/26/2017 10:36

Prep Date: 12/26/2017 10:36

Data File: 122617V1\1O103A.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		53.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		59.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		43.5	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.8	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		56.0	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		56.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		53.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		54.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		51.0	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		44.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		48.9	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		50.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		46.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		59.9	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		54.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		44.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.9	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		46.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.9	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		57.3	ug/L	0.300	1.00
78-93-3	2-Butanone		269	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		45.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		299	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		45.5	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		225	ug/L	1.50	5.00
67-64-1	Acetone		294	ug/L	1.50	10.0
75-05-8	Acetonitrile		1310	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		51.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.7	ug/L	0.300	1.00
74-97-5	Bromochloromethane		56.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		59.7	ug/L	0.300	1.00
75-25-2	Bromoform		51.4	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203948056  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 10:36  
**Prep Date:** 12/26/2017 10:36  
**Data File:** 122617V1\1O103A.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		66.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		252	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		62.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.8	ug/L	0.300	1.00
75-00-3	Chloroethane		60.0	ug/L	0.300	1.00
67-66-3	Chloroform		58.1	ug/L	0.300	1.00
74-87-3	Chloromethane		56.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		57.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		71.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		58.2	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		46.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		53.3	ug/L	0.300	1.00
74-88-4	Iodomethane		279	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		43.5	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		50.7	ug/L	1.00	10.0
91-20-3	Naphthalene		52.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		46.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.6	ug/L	0.300	1.00
108-88-3	Toluene		46.5	ug/L	0.300	1.00
79-01-6	Trichloroethylene		57.6	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		67.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		285	ug/L	1.50	5.00
75-01-4	Vinyl chloride		57.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		56.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		95.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5350	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.3	ug/L	0.300	1.00
95-47-6	o-Xylene		47.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		44.3	ug/L	0.300	1.00



Volatile  
Certificate of Analysis  
Sample Summary

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SDG Number:	2018-1240	Matrix:	WATER
Lab Sample ID:	1203948056		
Client Sample:	QC for batch 1728172	Client:	ARSL004
Client ID:	LCS for batch 1728172	Method:	SW-846:8260B
Batch ID:	1728172	Inst:	VOA1.I
Run Date:	12/26/2017 10:36	Analyst:	PXY1
Prep Date:	12/26/2017 10:36		
Data File:	122617V1\1O103A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		49.4	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		57.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	43.9	50.0	ug/L	88	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L	105	(70%-131%)
Toluene-d8	41.2	50.0	ug/L	82	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203948057  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 12:02  
**Prep Date:** 12/26/2017 12:02  
**Data File:** 122617V1\1O106A.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		50.0	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		266	ug/L	1.50	5.00
107-13-1	Acrylonitrile		266	ug/L	1.50	5.00
107-05-1	Allyl chloride		257	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:** 2018-1240  
**Lab Sample ID:** 1203948057  
**Client Sample:** QC for batch 1728172  
**Client ID:** LCS for batch 1728172  
**Batch ID:** 1728172  
**Run Date:** 12/26/2017 12:02  
**Prep Date:** 12/26/2017 12:02  
**Data File:** 122617V1\1O106A.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	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		211	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		2500	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		267	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		257	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		251	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		269	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: 2018-1240

Lab Sample ID: 1203948057

Client Sample: QC for batch 1728172

Client ID: LCS for batch 1728172

Batch ID: 1728172

Run Date: 12/26/2017 12:02

Prep Date: 12/26/2017 12:02

Data File: 122617V1\10106A.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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
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	43.6	50.0	ug/L 87	(71%-134%)
Bromofluorobenzene	54.0	50.0	ug/L 108	(70%-131%)
Toluene-d8	41.3	50.0	ug/L 83	(74%-124%)

# **Semi-Volatile Analysis**

# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2018-1240  
Work Order #: 439936**

**Method/Analysis Information**

<b>Procedure:</b>	<b>Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry</b>
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1725973
Prep Batch Number:	1725968

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3510C/8270D:

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
439936008	CAWA-18-150367
1203937914	Method Blank (MB)
1203937915	Laboratory Control Sample (LCS)
1203937918	Laboratory Control Sample Duplicate (LCSD)
1203937916	439936001(CAWA-18-148918) Matrix Spike (MS)
1203937917	439936001(CAWA-18-148918) 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-009 REV# 39.

Raw data reports are processed and reviewed by the analyst using the data analysis software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

**Calibration Information**

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package. The various calibration mixes may not be calibrated using all of the calibration levels. In addition, not all of the mixes are calibrated using the same levels.

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

#### **Initial Calibration**

All initial calibration requirements have been met for this sample delivery group (SDG) in this batch. A second source initial calibration verification (ICV) was included in the standard section directly behind the initial calibration.

#### **CCV Requirements**

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for samples 439936001 (CAWA-18-148918), 439936004 (CAWA-18-148943) and 439936008 (CAWA-18-150367) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

#### **Quality Control (QC) Information**

##### **Method Blank (MB) Statement**

The MB analyzed with this SDG in this batch met the acceptance criteria.

##### **Surrogate Recoveries**

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

##### **Laboratory Control Sample Duplicate (LCSD)**

An LCSD was analyzed along with an MS/MSD pair in this batch.

##### **Laboratory Control Sample (LCS) Recovery**

The LCS and/or LCSD (See Below) spike recoveries were not within the acceptance limits. The client established the limits of 70%-130%. Failures are expected. The data were reported per client request.

Sample	Analyte	Value
1203937915 (LCS)	2, 4-Dimethylphenol	45* (51%-104%)

##### **LCS/LCSD Relative Percent Difference (RPD) Statement**

The RPD values between the LCS and LCSD met the acceptance limits.

##### **QC Sample Designation**

Sample 439936001 (CAWA-18-148918) was selected for analysis as the matrix spike and matrix spike duplicate.

##### **Spike Recovery Statement**

The MS or MSD (See Below) spike recoveries were not within the acceptance limits. The associated MS or MSD passed recoveries, as did the LCS. It appears that the low spike recoveries were isolated to the MS or MSD only and were the result of a poor extraction.



Sample	Analyte	Value
1203937916 (CAWA-18-148918MS)	Benzidine	11* (15%-130%)
	Pyridine	22* (24%-93%)

#### **MS/MSD Relative Percent Difference (RPD) Statement**

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1203937916MS and 1203937917MSD (CAWA-18-148918)	Benzidine	126* (0%-30%)
	Pyridine	63* (0%-30%)

#### **Internal Standard (ISTD) Acceptance**

The internal standard responses used to quantitate the requested target analytes were within the required acceptance criteria for the SDG associated samples in this batch.

#### **Technical Information:**

##### **Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time. GEL assigns holding times based on the associated methodology that 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.

##### **Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP. All reported compound mass spectra met the detection specifications in the method.

##### **Sample Dilutions**

The samples in this SDG in this batch did not require dilutions.

##### **Sample Re-extraction/Re-analysis**

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

#### **Miscellaneous Information:**

##### **Manual Integrations**

Manual integrations were not required on samples in this batch in this SDG for detected target analytes or surrogates.

##### **TIC Comment**

Tentatively identified compounds (TIC) were requested for samples 439936001 (CAWA-18-148918), 439936004 (CAWA-18-148943) and 439936008 (CAWA-18-150367) in this SDG in this batch.

##### **Additional Comments**

Additional comments were not required for the SDG associated samples in this batch.

### **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 Semi-Volatile-GC/MS analysis was performed on the following instrument configuration:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
MSD1.I	Agilent 6890N/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Polysilarylene-95% Polydimethylsiloxane)

### **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: 2018-1240 GEL Work Order: 439936

#### 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: Barbara Bailey

Date: 09 JAN 2018

Title: Data Validator

# **Sample Data Summary**

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

Page 1 of 3

SDG Number: 2018-1240

Lab Sample ID: 439936001

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-148918

Batch ID: 1725973

Run Date: 12/18/2017 15:31

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111812.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.00	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	3.00	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
122-66-7	Azobenzene	U	3.00	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	3.00	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.00	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	3.00	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	3.00	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	3.00	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	3.00	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	5.00	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	0.410	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	3.00	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.00	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	3.00	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	3.00	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	3.00	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	3.00	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.30	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	3.00	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	3.00	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	0.300	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	0.300	ug/L	0.300	1.00
62-53-3	Aniline	U	4.20	ug/L	4.20	10.0
120-12-7	Anthracene	U	0.300	ug/L	0.300	1.00
1912-24-9	Atrazine	U	3.00	ug/L	3.00	10.0
92-87-5	Benzidine	U	3.90	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	0.300	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	0.300	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	0.300	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	0.300	ug/L	0.300	1.00

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

Page 2 of 3

SDG Number: 2018-1240

Lab Sample ID: 439936001

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD1.I

Dilution: 1

Batch ID: 1725973

Analyst: JMB3

Inj. Vol: 1 uL

Run Date: 12/18/2017 15:31

Prep Date: 12/14/2017 18:07

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s121817.B\s111812.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.300	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	6.00	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	3.00	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	3.00	ug/L	3.00	10.0
218-01-9	Chrysene	U	0.300	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	3.00	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	3.00	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	0.300	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	3.00	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	3.00	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	3.00	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	3.00	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	0.300	ug/L	0.300	1.00
86-73-7	Fluorene	U	0.300	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	3.00	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	3.00	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	3.00	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	3.00	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.300	ug/L	0.300	1.00
78-59-1	Isophorone	U	3.50	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.00	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine	U	3.00	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.00	ug/L	3.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	3.00	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	3.00	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	0.300	ug/L	0.300	1.00
108-95-2	Phenol	U	3.00	ug/L	3.00	10.0
129-00-0	Pyrene	U	0.300	ug/L	0.300	1.00
110-86-1	Pyridine	U	3.00	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.00	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	3.00	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	3.00	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.00	ug/L	3.00	10.0

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936001

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-148918

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1725973

Inst: MSD1.I

Dilution: 1

Run Date: 12/18/2017 15:31

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 12/14/2017 18:07

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s121817.B\s111812.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	65.8	100	ug/L	66	(32%-124%)
2-Fluorobiphenyl	25.9	50.0	ug/L	52	(32%-112%)
2-Fluorophenol	30.8	100	ug/L	31	(15%-88%)
Nitrobenzene-d5	27.9	50.0	ug/L	56	(36%-115%)
Phenol-d5	19.6	100	ug/L	20	(15%-91%)
p-Terphenyl-d14	37.8	50.0	ug/L	76	(36%-121%)

**Tentatively Identified Compound Summary**

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

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936004

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-148943

Batch ID: 1725973

Run Date: 12/18/2017 17:05

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111815.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 970 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.09	ug/L	3.09	10.3
120-82-1	1,2,4-Trichlorobenzene	U	3.09	ug/L	3.09	10.3
95-50-1	1,2-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
122-66-7	Azobenzene	U	3.09	ug/L	3.09	10.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
106-46-7	1,4-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
123-91-1	1,4-Dioxane	U	3.09	ug/L	3.09	10.3
90-12-0	1-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.09	ug/L	3.09	10.3
95-95-4	2,4,5-Trichlorophenol	U	3.09	ug/L	3.09	10.3
88-06-2	2,4,6-Trichlorophenol	U	3.09	ug/L	3.09	10.3
120-83-2	2,4-Dichlorophenol	U	3.09	ug/L	3.09	10.3
105-67-9	2,4-Dimethylphenol	U	3.09	ug/L	3.09	10.3
51-28-5	2,4-Dinitrophenol	U	5.15	ug/L	5.15	20.6
121-14-2	2,4-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
606-20-2	2,6-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
91-58-7	2-Chloronaphthalene	U	0.423	ug/L	0.423	1.03
95-57-8	2-Chlorophenol	U	3.09	ug/L	3.09	10.3
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.09	ug/L	3.09	10.3
91-57-6	2-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
88-75-5	2-Nitrophenol	U	3.09	ug/L	3.09	10.3
91-94-1	3,3'-Dichlorobenzidine	U	3.09	ug/L	3.09	10.3
101-55-3	4-Bromophenylphenylether	U	3.09	ug/L	3.09	10.3
59-50-7	Parachlorometa cresol	U	3.09	ug/L	3.09	10.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.40	ug/L	3.40	10.3
7005-72-3	4-Chlorophenylphenylether	U	3.09	ug/L	3.09	10.3
100-02-7	4-Nitrophenol	U	3.09	ug/L	3.09	10.3
83-32-9	Acenaphthene	U	0.309	ug/L	0.309	1.03
208-96-8	Acenaphthylene	U	0.309	ug/L	0.309	1.03
62-53-3	Aniline	U	4.33	ug/L	4.33	10.3
120-12-7	Anthracene	U	0.309	ug/L	0.309	1.03
1912-24-9	Atrazine	U	3.09	ug/L	3.09	10.3
92-87-5	Benzidine	U	4.02	ug/L	4.02	10.3
56-55-3	Benzo(a)anthracene	U	0.309	ug/L	0.309	1.03
50-32-8	Benzo(a)pyrene	U	0.309	ug/L	0.309	1.03
205-99-2	Benzo(b)fluoranthene	U	0.309	ug/L	0.309	1.03
191-24-2	Benzo(ghi)perylene	U	0.309	ug/L	0.309	1.03



**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936004

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-148943

Batch ID: 1725973

Run Date: 12/18/2017 17:05

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111815.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 970 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.309	ug/L	0.309	1.03
65-85-0	Benzoic acid	U	6.19	ug/L	6.19	20.6
100-51-6	Benzyl alcohol	U	3.09	ug/L	3.09	10.3
85-68-7	Butylbenzylphthalate	U	3.09	ug/L	3.09	10.3
218-01-9	Chrysene	U	0.309	ug/L	0.309	1.03
84-74-2	Di-n-butylphthalate	U	3.09	ug/L	3.09	10.3
117-84-0	Di-n-octylphthalate	U	3.09	ug/L	3.09	10.3
53-70-3	Dibenzo(a,h)anthracene	U	0.309	ug/L	0.309	1.03
132-64-9	Dibenzofuran	U	3.09	ug/L	3.09	10.3
84-66-2	Diethylphthalate	U	3.09	ug/L	3.09	10.3
131-11-3	Dimethylphthalate	U	3.09	ug/L	3.09	10.3
88-85-7	Dinoseb	U	3.09	ug/L	3.09	10.3
122-39-4	Diphenylamine	U	3.09	ug/L	3.09	10.3
206-44-0	Fluoranthene	U	0.309	ug/L	0.309	1.03
86-73-7	Fluorene	U	0.309	ug/L	0.309	1.03
118-74-1	Hexachlorobenzene	U	3.09	ug/L	3.09	10.3
87-68-3	Hexachlorobutadiene	U	3.09	ug/L	3.09	10.3
77-47-4	Hexachlorocyclopentadiene	U	3.09	ug/L	3.09	10.3
67-72-1	Hexachloroethane	U	3.09	ug/L	3.09	10.3
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.309	ug/L	0.309	1.03
78-59-1	Isophorone	U	3.61	ug/L	3.61	10.3
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.09	ug/L	3.09	10.3
924-16-3	N-Nitrosodi-n-butylamine	U	3.09	ug/L	3.09	10.3
55-18-5	N-Nitrosodiethylamine	U	3.09	ug/L	3.09	10.3
621-64-7	N-Nitrosodi-n-propylamine	U	3.09	ug/L	3.09	10.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.09	ug/L	3.09	10.3
91-20-3	Naphthalene	U	0.309	ug/L	0.309	1.03
98-95-3	Nitrobenzene	U	3.09	ug/L	3.09	10.3
608-93-5	Pentachlorobenzene	U	3.09	ug/L	3.09	10.3
87-86-5	Pentachlorophenol	U	3.09	ug/L	3.09	10.3
85-01-8	Phenanthrene	U	0.309	ug/L	0.309	1.03
108-95-2	Phenol	U	3.09	ug/L	3.09	10.3
129-00-0	Pyrene	U	0.309	ug/L	0.309	1.03
110-86-1	Pyridine	U	3.09	ug/L	3.09	10.3
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.09	ug/L	3.09	10.3
111-91-1	bis(2-Chloroethoxy)methane	U	3.09	ug/L	3.09	10.3
111-44-4	bis(2-Chloroethyl) ether	U	3.09	ug/L	3.09	10.3
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.09	ug/L	3.09	10.3

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936004

Date Collected: 12/11/2017 10:31

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-18-148943

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1725973

Inst: MSD1.I

Dilution: 1

Run Date: 12/18/2017 17:05

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 12/14/2017 18:07

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s121817.B\s111815.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.81	ug/L	3.81	10.3
99-09-2	3-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.09	ug/L	3.09	10.3
88-74-4	2-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.09	ug/L	3.09	10.3
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	66.8	103	ug/L 65	(32%-124%)
2-Fluorobiphenyl	32.8	51.5	ug/L 64	(32%-112%)
2-Fluorophenol	31.9	103	ug/L 31	(15%-88%)
Nitrobenzene-d5	31.5	51.5	ug/L 61	(36%-115%)
Phenol-d5	20.0	103	ug/L 19	(15%-91%)
p-Terphenyl-d14	37.1	51.5	ug/L 72	(36%-121%)

**Tentatively Identified Compound Summary**

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

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

Page 1 of 3

SDG Number: 2018-1240

Lab Sample ID: 439936008

Date Collected: 12/11/2017 10:56

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-150367

Batch ID: 1725973

Run Date: 12/18/2017 17:36

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111816.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 960 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.13	ug/L	3.13	10.4
120-82-1	1,2,4-Trichlorobenzene	U	3.13	ug/L	3.13	10.4
95-50-1	1,2-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
122-66-7	Azobenzene	U	3.13	ug/L	3.13	10.4
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
106-46-7	1,4-Dichlorobenzene	U	3.13	ug/L	3.13	10.4
123-91-1	1,4-Dioxane	U	3.13	ug/L	3.13	10.4
90-12-0	1-Methylnaphthalene	U	0.313	ug/L	0.313	1.04
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.13	ug/L	3.13	10.4
95-95-4	2,4,5-Trichlorophenol	U	3.13	ug/L	3.13	10.4
88-06-2	2,4,6-Trichlorophenol	U	3.13	ug/L	3.13	10.4
120-83-2	2,4-Dichlorophenol	U	3.13	ug/L	3.13	10.4
105-67-9	2,4-Dimethylphenol	U	3.13	ug/L	3.13	10.4
51-28-5	2,4-Dinitrophenol	U	5.21	ug/L	5.21	20.8
121-14-2	2,4-Dinitrotoluene	U	3.13	ug/L	3.13	10.4
606-20-2	2,6-Dinitrotoluene	U	3.13	ug/L	3.13	10.4
91-58-7	2-Chloronaphthalene	U	0.427	ug/L	0.427	1.04
95-57-8	2-Chlorophenol	U	3.13	ug/L	3.13	10.4
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.13	ug/L	3.13	10.4
91-57-6	2-Methylnaphthalene	U	0.313	ug/L	0.313	1.04
88-75-5	2-Nitrophenol	U	3.13	ug/L	3.13	10.4
91-94-1	3,3'-Dichlorobenzidine	U	3.13	ug/L	3.13	10.4
101-55-3	4-Bromophenylphenylether	U	3.13	ug/L	3.13	10.4
59-50-7	Parachlorometa cresol	U	3.13	ug/L	3.13	10.4
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.44	ug/L	3.44	10.4
7005-72-3	4-Chlorophenylphenylether	U	3.13	ug/L	3.13	10.4
100-02-7	4-Nitrophenol	U	3.13	ug/L	3.13	10.4
83-32-9	Acenaphthene	U	0.313	ug/L	0.313	1.04
208-96-8	Acenaphthylene	U	0.313	ug/L	0.313	1.04
62-53-3	Aniline	U	4.38	ug/L	4.38	10.4
120-12-7	Anthracene	U	0.313	ug/L	0.313	1.04
1912-24-9	Atrazine	U	3.13	ug/L	3.13	10.4
92-87-5	Benzidine	U	4.06	ug/L	4.06	10.4
56-55-3	Benzo(a)anthracene	U	0.313	ug/L	0.313	1.04
50-32-8	Benzo(a)pyrene	U	0.313	ug/L	0.313	1.04
205-99-2	Benzo(b)fluoranthene	U	0.313	ug/L	0.313	1.04
191-24-2	Benzo(ghi)perylene	U	0.313	ug/L	0.313	1.04

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936008

Date Collected: 12/11/2017 10:56

Date Received: 12/13/2017 09:20

Matrix: W

Client ID: CAWA-18-150367

Batch ID: 1725973

Run Date: 12/18/2017 17:36

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111816.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 960 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.313	ug/L	0.313	1.04
65-85-0	Benzoic acid	U	6.25	ug/L	6.25	20.8
100-51-6	Benzyl alcohol	U	3.13	ug/L	3.13	10.4
85-68-7	Butylbenzylphthalate	U	3.13	ug/L	3.13	10.4
218-01-9	Chrysene	U	0.313	ug/L	0.313	1.04
84-74-2	Di-n-butylphthalate	U	3.13	ug/L	3.13	10.4
117-84-0	Di-n-octylphthalate	U	3.13	ug/L	3.13	10.4
53-70-3	Dibenzo(a,h)anthracene	U	0.313	ug/L	0.313	1.04
132-64-9	Dibenzofuran	U	3.13	ug/L	3.13	10.4
84-66-2	Diethylphthalate	U	3.13	ug/L	3.13	10.4
131-11-3	Dimethylphthalate	U	3.13	ug/L	3.13	10.4
88-85-7	Dinoseb	U	3.13	ug/L	3.13	10.4
122-39-4	Diphenylamine	U	3.13	ug/L	3.13	10.4
206-44-0	Fluoranthene	U	0.313	ug/L	0.313	1.04
86-73-7	Fluorene	U	0.313	ug/L	0.313	1.04
118-74-1	Hexachlorobenzene	U	3.13	ug/L	3.13	10.4
87-68-3	Hexachlorobutadiene	U	3.13	ug/L	3.13	10.4
77-47-4	Hexachlorocyclopentadiene	U	3.13	ug/L	3.13	10.4
67-72-1	Hexachloroethane	U	3.13	ug/L	3.13	10.4
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.313	ug/L	0.313	1.04
78-59-1	Isophorone	U	3.65	ug/L	3.65	10.4
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.13	ug/L	3.13	10.4
924-16-3	N-Nitrosodi-n-butylamine	U	3.13	ug/L	3.13	10.4
55-18-5	N-Nitrosodiethylamine	U	3.13	ug/L	3.13	10.4
621-64-7	N-Nitrosodi-n-propylamine	U	3.13	ug/L	3.13	10.4
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.13	ug/L	3.13	10.4
91-20-3	Naphthalene	U	0.313	ug/L	0.313	1.04
98-95-3	Nitrobenzene	U	3.13	ug/L	3.13	10.4
608-93-5	Pentachlorobenzene	U	3.13	ug/L	3.13	10.4
87-86-5	Pentachlorophenol	U	3.13	ug/L	3.13	10.4
85-01-8	Phenanthrene	U	0.313	ug/L	0.313	1.04
108-95-2	Phenol	U	3.13	ug/L	3.13	10.4
129-00-0	Pyrene	U	0.313	ug/L	0.313	1.04
110-86-1	Pyridine	U	3.13	ug/L	3.13	10.4
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.13	ug/L	3.13	10.4
111-91-1	bis(2-Chloroethoxy)methane	U	3.13	ug/L	3.13	10.4
111-44-4	bis(2-Chloroethyl) ether	U	3.13	ug/L	3.13	10.4
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.13	ug/L	3.13	10.4

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 439936008

Date Collected: 12/11/2017 10:56

Date Received: 12/13/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD1.I

Dilution: 1

Batch ID: 1725973

Run Date: 12/18/2017 17:36

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 12/14/2017 18:07

Aliquot: 960 mL

Final Volume: 1 mL

Data File: s121817.B\s111816.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.85	ug/L	3.85	10.4
99-09-2	3-Nitroaniline	U	3.13	ug/L	3.13	10.4
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.13	ug/L	3.13	10.4
88-74-4	2-Nitroaniline	U	3.13	ug/L	3.13	10.4
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.13	ug/L	3.13	10.4
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	76.2	104	ug/L 73	(32%-124%)
2-Fluorobiphenyl	36.2	52.1	ug/L 69	(32%-112%)
2-Fluorophenol	39.0	104	ug/L 37	(15%-88%)
Nitrobenzene-d5	36.2	52.1	ug/L 69	(36%-115%)
Phenol-d5	24.3	104	ug/L 23	(15%-91%)
p-Terphenyl-d14	38.6	52.1	ug/L 74	(36%-121%)

**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**

Semi-Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1240

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203937915	LCS for batch 1725968	32	20	56	45	71	68
1203937918	LCSD for batch 1725968	34	20	58	48	70	68
1203937914	MB for batch 1725968	36	21	64	44	70	76
439936001	CAWA-18-148918	31	20	56	52	66	76
1203937916	CAWA-18-148918MS	50	37	64	59	83	79
1203937917	CAWA-18-148918MSD	50	38	66	63	79	70
439936004	CAWA-18-148943	31	19	61	64	65	72
439936008	CAWA-18-150367	37	23	69	69	73	74

## Surrogate

## Acceptance Limits

2FP	= 2-Fluorophenol	(15%-88%)
PHL	= Phenol-d5	(15%-91%)
NBZ	= Nitrobenzene-d5	(36%-115%)
FBP	= 2-Fluorobiphenyl	(32%-112%)
TBP	= 2,4,6-Tribromophenol	(32%-124%)
TPH	= p-Terphenyl-d14	(36%-121%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1725968

Matrix: WATER

Lab Sample ID 1203937915

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:11

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylamine	50.0	0.0	15.5	31	30-88
110-86-1	LCS Pyridine	50.0	0.0	17.3	35	27-89
62-53-3	LCS Aniline	50.0	0.0	27.6	55	49-112
108-95-2	LCS Phenol	50.0	0.0	10.7	21	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	28.5	57	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	26.3	53	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	20.4	41	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	20.0	40	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	21.3	43	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	27.7	55	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	23.8	48	44-102
95-48-7	LCS o-Cresol	50.0	0.0	23.9	48	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	24.5	49	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	27.1	54	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	20.1	40	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	27.6	55	53-115
78-59-1	LCS Isophorone	50.0	0.0	28.2	56	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	29.4	59	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	22.4	45 *	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	28.9	58	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	28.0	56	53-109
65-85-0	LCS Benzoic acid	100	0.0	29.3	29	21-74



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1725968

Matrix: WATER

Lab Sample ID 1203937915

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:11

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	36.8	74	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	21.3	43	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	31.0	62	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	23.8	48	42-103
91-20-3	LCS Naphthalene	50.0	0.0	23.6	47	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	24.3	49	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	20.9	42	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	31.0	62	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	31.3	63	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	24.5	49	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	32.0	64	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	42.9	86	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	34.6	69	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	34.1	68	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	35.9	72	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	28.2	56	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	29.7	59	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	32.6	65	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	29.3	59	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	35.1	70	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	35.0	70	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	11.2	22	15-137

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1725968

Matrix: WATER

Lab Sample ID 1203937915

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:11

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	30.9	62	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	31.1	62	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	35.9	72	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	35.0	70	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	29.9	60	55-113
122-66-7	LCS Azobenzene	50.0	0.0	29.1	58	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	30.8	62	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	31.2	62	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	37.8	76	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	32.0	64	55-110
120-12-7	LCS Anthracene	50.0	0.0	31.6	63	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	33.9	68	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	34.3	69	54-118
129-00-0	LCS Pyrene	50.0	0.0	31.0	62	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	33.3	67	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	32.1	64	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	34.2	68	57-112
218-01-9	LCS Chrysene	50.0	0.0	33.2	66	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	30.6	61	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	33.5	67	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	35.5	71	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	32.1	64	40-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1725968

Matrix: WATER

Lab Sample ID 1203937915

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:11

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	28.3	57	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	30.5	61	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	27.5	55	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	20.2	40	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	32.0	64	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	29.3	59	44-102
1912-24-9	LCS Atrazine	50.0	0.0	43.1	86	60-131
92-87-5	LCS Benzidine	100	0.0	72.1	72	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	37.1	74	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	22.9	46	39-99

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1725968

Matrix: WATER

Lab Sample ID 1203937918

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:47

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	LCSD N-Methyl-N-nitrosomethylamine	50.0	0.0	16.8	34	30-88	8	0-30
110-86-1	LCSD Pyridine	50.0	0.0	18.9	38	27-89	9	0-30
62-53-3	LCSD Aniline	50.0	0.0	29.2	58	49-112	6	0-30
108-95-2	LCSD Phenol	50.0	0.0	11.2	22	16-82	5	0-30
111-44-4	LCSD bis(2-Chloroethyl) ether	50.0	0.0	30.7	61	51-111	7	0-30
95-57-8	LCSD 2-Chlorophenol	50.0	0.0	28.5	57	49-105	8	0-30
541-73-1	LCSD 1,3-Dichlorobenzene	50.0	0.0	23.1	46	37-95	12	0-30
106-46-7	LCSD 1,4-Dichlorobenzene	50.0	0.0	22.6	45	38-96	12	0-30
95-50-1	LCSD 1,2-Dichlorobenzene	50.0	0.0	23.2	46	39-97	8	0-30
108-60-1	LCSD bis(2-Chloro-1-methylethyl)ether	50.0	0.0	28.9	58	44-123	4	0-30
100-51-6	LCSD Benzyl alcohol	50.0	0.0	26.6	53	44-102	11	0-30
95-48-7	LCSD o-Cresol	50.0	0.0	24.8	50	41-101	4	0-30
65794-96-9	LCSD m,p-Cresols	50.0	0.0	25.5	51	43-102	4	0-30
621-64-7	LCSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	28.2	56	54-115	4	0-30
67-72-1	LCSD Hexachloroethane	50.0	0.0	22.0	44	36-96	9	0-30
98-95-3	LCSD Nitrobenzene	50.0	0.0	30.3	61	53-115	9	0-30
78-59-1	LCSD Isophorone	50.0	0.0	30.2	60	56-117	7	0-30
88-75-5	LCSD 2-Nitrophenol	50.0	0.0	29.4	59	51-113	0	0-30
105-67-9	LCSD 2,4-Dimethylphenol	50.0	0.0	27.4	55	51-104	20	0-30
111-91-1	LCSD bis(2-Chloroethoxy)methane	50.0	0.0	31.6	63	55-114	9	0-30
120-83-2	LCSD 2,4-Dichlorophenol	50.0	0.0	31.7	63	53-109	12	0-30
65-85-0	LCSD Benzoic acid	100	0.0	30.4	30	21-74	4	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1725968

Matrix: WATER

Lab Sample ID 1203937918

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:47

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	LCSD 4-Chloroaniline	50.0	0.0	38.9	78	65-136	6	0-30
87-68-3	LCSD Hexachlorobutadiene	50.0	0.0	23.9	48	35-98	12	0-30
59-50-7	LCSD Parachlorometa cresol <i>4-Chloro-3-methylphenol</i>	50.0	0.0	32.8	66	55-115	6	0-30
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	25.0	50	42-103	5	0-30
91-20-3	LCSD Naphthalene	50.0	0.0	25.5	51	44-102	8	0-30
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	26.7	53	45-108	10	0-30
77-47-4	LCSD Hexachlorocyclopentadiene	50.0	0.0	19.9	40	34-89	5	0-30
88-06-2	LCSD 2,4,6-Trichlorophenol	50.0	0.0	31.2	62	55-120	1	0-30
95-95-4	LCSD 2,4,5-Trichlorophenol	50.0	0.0	33.5	67	55-116	7	0-30
91-58-7	LCSD 2-Chloronaphthalene	50.0	0.0	25.5	51	44-107	4	0-30
88-74-4	LCSD 2-Nitroaniline <i>o-Nitroaniline</i>	50.0	0.0	33.1	66	53-121	3	0-30
99-09-2	LCSD 3-Nitroaniline <i>m-Nitroaniline</i>	50.0	0.0	42.7	85	61-139	0	0-30
131-11-3	LCSD Dimethylphthalate	50.0	0.0	36.7	73	60-122	6	0-30
606-20-2	LCSD 2,6-Dinitrotoluene	50.0	0.0	35.1	70	59-122	3	0-30
121-14-2	LCSD 2,4-Dinitrotoluene	50.0	0.0	35.0	70	57-124	2	0-30
208-96-8	LCSD Acenaphthylene	50.0	0.0	28.9	58	50-113	3	0-30
83-32-9	LCSD Acenaphthene	50.0	0.0	30.8	62	49-112	4	0-30
51-28-5	LCSD 2,4-Dinitrophenol	50.0	0.0	32.9	66	34-122	1	0-30
132-64-9	LCSD Dibenzofuran	50.0	0.0	30.2	60	50-111	3	0-30
58-90-2	LCSD 2,3,4,6-Tetrachlorophenol	50.0	0.0	34.8	70	54-122	1	0-30
84-66-2	LCSD Diethylphthalate	50.0	0.0	36.3	73	57-122	4	0-30
100-02-7	LCSD 4-Nitrophenol	50.0	0.0	10.3	21	15-137	9	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1725968

Matrix: WATER

Lab Sample ID 1203937918

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:47

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	LCSD Fluorene	50.0	0.0	31.0	62	52-114	0	0-30
7005-72-3	LCSD 4-Chlorophenylphenylether	50.0	0.0	31.9	64	52-121	2	0-30
100-01-6	LCSD 4-Nitroaniline <i>p</i> -Nitroaniline	50.0	0.0	35.2	70	44-137	2	0-30
534-52-1	LCSD 2-Methyl-4,6-dinitrophenol	50.0	0.0	35.1	70	45-124	0	0-30
122-39-4	LCSD Diphenylamine	50.0	0.0	30.9	62	55-113	3	0-30
122-66-7	LCSD Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	29.7	59	53-115	2	0-30
101-55-3	LCSD 4-Bromophenylphenylether	50.0	0.0	31.9	64	54-116	4	0-30
118-74-1	LCSD Hexachlorobenzene	50.0	0.0	33.2	66	54-115	6	0-30
87-86-5	LCSD Pentachlorophenol	50.0	0.0	37.8	76	41-116	0	0-30
85-01-8	LCSD Phenanthrene	50.0	0.0	32.3	65	55-110	1	0-30
120-12-7	LCSD Anthracene	50.0	0.0	32.6	65	56-112	3	0-30
84-74-2	LCSD Di-n-butylphthalate	50.0	0.0	34.4	69	57-123	1	0-30
206-44-0	LCSD Fluoranthene	50.0	0.0	34.9	70	54-118	2	0-30
129-00-0	LCSD Pyrene	50.0	0.0	31.7	63	49-121	2	0-30
85-68-7	LCSD Butylbenzylphthalate	50.0	0.0	33.4	67	52-125	0	0-30
117-81-7	LCSD bis(2-Ethylhexyl)phthalate	50.0	0.0	32.8	66	52-125	2	0-30
56-55-3	LCSD Benzo(a)anthracene	50.0	0.0	34.4	69	57-112	0	0-30
218-01-9	LCSD Chrysene	50.0	0.0	33.4	67	58-117	1	0-30
117-84-0	LCSD Di-n-octylphthalate	50.0	0.0	30.0	60	50-129	2	0-30
205-99-2	LCSD Benzo(b)fluoranthene	50.0	0.0	33.1	66	41-118	1	0-30
207-08-9	LCSD Benzo(k)fluoranthene	50.0	0.0	35.9	72	42-121	1	0-30
50-32-8	LCSD Benzo(a)pyrene	50.0	0.0	33.0	66	40-118	3	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1725968

Matrix: WATER

Lab Sample ID 1203937918

Instrument: MSD1.I

Analysis Date: 12/17/2017 14:47

Dilution: 1

Analyst: LOF

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	50.0	0.0	33.0	66	34-125	15	0-30
53-70-3	LCSD Dibenzo(a,h)anthracene	50.0	0.0	34.3	69	38-129	12	0-30
191-24-2	LCSD Benzo(ghi)perylene	50.0	0.0	33.0	66	33-131	18	0-30
123-91-1	LCSD 1,4-Dioxane	50.0	0.0	22.1	44	38-78	9	0-30
930-55-2	LCSD N-Nitrosopyrrolidine	50.0	0.0	34.0	68	54-113	6	0-30
95-94-3	LCSD 1,2,4,5-Tetrachlorobenzene	50.0	0.0	30.7	61	44-102	5	0-30
1912-24-9	LCSD Atrazine	50.0	0.0	44.6	89	60-131	3	0-30
92-87-5	LCSD Benzidine	100	0.0	69.1	69	20-144	4	0-30
91-94-1	LCSD 3,3'-Dichlorobenzidine	50.0	0.0	36.5	73	43-127	2	0-30
120-82-1	LCSD 1,2,4-Trichlorobenzene	50.0	0.0	25.4	51	39-99	11	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1240

Sample Type: Matrix Spike

Client ID: CAWA-18-148918MS

Matrix: W

Lab Sample ID 1203937916

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:02

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylamine	106	0.00 U	53.4	50	25-106
110-86-1	MS Pyridine	106	0.00 U	23.6	22 *	24-93
62-53-3	MS Aniline	106	0.00 U	53.2	50	37-113
108-95-2	MS Phenol	106	0.00 U	42.5	40	23-82
111-44-4	MS bis(2-Chloroethyl) ether	106	0.00 U	67.6	64	39-114
95-57-8	MS 2-Chlorophenol	106	0.00 U	67.1	63	37-108
541-73-1	MS 1,3-Dichlorobenzene	106	0.00 U	53.4	50	27-97
106-46-7	MS 1,4-Dichlorobenzene	106	0.00 U	52.6	49	28-97
95-50-1	MS 1,2-Dichlorobenzene	106	0.00 U	54.0	51	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)ether	106	0.00 U	68.1	64	32-127
100-51-6	MS Benzyl alcohol	106	0.00 U	66.9	63	37-116
95-48-7	MS o-Cresol	106	0.00 U	66.8	63	34-109
65794-96-9	MS m,p-Cresols	106	0.00 U	70.7	66	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	106	0.00 U	67.1	63	42-118
67-72-1	MS Hexachloroethane	106	0.00 U	51.7	49	29-94
98-95-3	MS Nitrobenzene	106	0.00 U	68.9	65	38-123
78-59-1	MS Isophorone	106	0.00 U	68.8	65	43-120
88-75-5	MS 2-Nitrophenol	106	0.00 U	71.2	67	39-115
105-67-9	MS 2,4-Dimethylphenol	106	0.00 U	60.3	57	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	106	0.00 U	71.1	67	42-118
120-83-2	MS 2,4-Dichlorophenol	106	0.00 U	70.3	66	40-111
65-85-0	MS Benzoic acid	213	0.00 U	114	54	17-95



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike

Client ID: CAWA-18-148918MS

Matrix: W

Lab Sample ID 1203937916

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:02

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS 4-Chloroaniline	106	0.00 U	88.6	83	44-138
87-68-3	MS Hexachlorobutadiene	106	0.00 U	53.0	50	26-98
59-50-7	MS Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00 U	79.9	75	41-122
91-57-6	MS 2-Methylnaphthalene	106	0.00 U	59.9	56	29-109
91-20-3	MS Naphthalene	106	0.00 U	59.4	56	31-108
90-12-0	MS 1-Methylnaphthalene	106	0.00 U	63.0	59	33-112
77-47-4	MS Hexachlorocyclopentadiene	106	0.00 U	41.4	39	26-79
88-06-2	MS 2,4,6-Trichlorophenol	106	0.00 U	78.0	73	39-124
95-95-4	MS 2,4,5-Trichlorophenol	106	0.00 U	79.6	75	42-120
91-58-7	MS 2-Chloronaphthalene	106	0.00 U	63.4	60	29-113
88-74-4	MS 2-Nitroaniline o-Nitroaniline	106	0.00 U	76.7	72	41-121
99-09-2	MS 3-Nitroaniline m-Nitroaniline	106	0.00 U	107	101	42-144
131-11-3	MS Dimethylphthalate	106	0.00 U	86.4	81	45-128
606-20-2	MS 2,6-Dinitrotoluene	106	0.00 U	86.8	82	46-124
121-14-2	MS 2,4-Dinitrotoluene	106	0.00 U	83.2	78	45-125
208-96-8	MS Acenaphthylene	106	0.00 U	71.8	67	35-120
83-32-9	MS Acenaphthene	106	0.00 U	76.7	72	35-117
51-28-5	MS 2,4-Dinitrophenol	106	0.00 U	68.9	65	27-122
132-64-9	MS Dibenzofuran	106	0.00 U	74.2	70	38-113
58-90-2	MS 2,3,4,6-Tetrachlorophenol	106	0.00 U	86.4	81	40-128
84-66-2	MS Diethylphthalate	106	0.00 U	87.6	82	43-127
100-02-7	MS 4-Nitrophenol	106	0.00 U	43.0	40	17-85

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike

Client ID: CAWA-18-148918MS

Matrix: W

Lab Sample ID 1203937916

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:02

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS Fluorene	106	0.00 U	75.5	71	39-117
7005-72-3	MS 4-Chlorophenylphenylether	106	0.00 U	77.2	73	39-121
100-01-6	MS 4-Nitroaniline	106	0.00 U	88.1	83	30-133
534-52-1	MS 2-Methyl-4,6-dinitrophenol	106	0.00 U	80.5	76	32-126
122-39-4	MS Diphenylamine	106	0.00 U	73.6	69	37-118
122-66-7	MS Azobenzene	106	0.00 U	71.1	67	38-120
101-55-3	MS 4-Bromophenylphenylether	106	0.00 U	76.3	72	39-121
118-74-1	MS Hexachlorobenzene	106	0.00 U	77.5	73	40-118
87-86-5	MS Pentachlorophenol	106	0.00 U	86.6	81	35-121
85-01-8	MS Phenanthrene	106	0.00 U	76.1	72	40-115
120-12-7	MS Anthracene	106	0.00 U	75.2	71	38-120
84-74-2	MS Di-n-butylphthalate	106	0.00 U	79.4	75	41-128
206-44-0	MS Fluoranthene	106	0.00 U	81.0	76	41-119
129-00-0	MS Pyrene	106	0.00 U	73.8	69	35-128
85-68-7	MS Butylbenzylphthalate	106	0.00 U	77.0	72	40-129
117-81-7	MS bis(2-Ethylhexyl)phthalate	106	0.00 U	72.2	68	38-131
56-55-3	MS Benzo(a)anthracene	106	0.00 U	79.6	75	39-120
218-01-9	MS Chrysene	106	0.00 U	78.0	73	41-124
117-84-0	MS Di-n-octylphthalate	106	0.00 U	67.7	64	37-134
205-99-2	MS Benzo(b)fluoranthene	106	0.00 U	76.3	72	31-122
207-08-9	MS Benzo(k)fluoranthene	106	0.00 U	81.3	76	33-123
50-32-8	MS Benzo(a)pyrene	106	0.00 U	74.7	70	32-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike

Client ID: CAWA-18-148918MS

Matrix: W

Lab Sample ID 1203937916

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:02

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	106	0.00 U	74.1	70	27-121
53-70-3	MS Dibenzo(a,h)anthracene	106	0.00 U	75.5	71	30-125
191-24-2	MS Benzo(ghi)perylene	106	0.00 U	73.2	69	24-126
123-91-1	MS 1,4-Dioxane	106	0.00 U	65.7	62	24-110
930-55-2	MS N-Nitrosopyrrolidine	106	0.00 U	85.1	80	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	106	0.00 U	76.4	72	32-101
1912-24-9	MS Atrazine	106	0.00 U	109	102	42-129
92-87-5	MS Benzidine	213	0.00 U	24.0	11 *	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	106	0.00 U	79.6	75	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	106	0.00 U	58.7	55	26-102

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-148918MSD

Matrix: W

Lab Sample ID 1203937917

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylamine	106	0.00	U 48.6	46	25-106	9	0-30
110-86-1	MSD Pyridine	106	0.00	U 45.3	43	24-93	63 *	0-30
62-53-3	MSD Aniline	106	0.00	U 61.9	58	37-113	15	0-30
108-95-2	MSD Phenol	106	0.00	U 43.8	41	23-82	3	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	106	0.00	U 70.9	67	39-114	5	0-30
95-57-8	MSD 2-Chlorophenol	106	0.00	U 68.3	64	37-108	2	0-30
541-73-1	MSD 1,3-Dichlorobenzene	106	0.00	U 56.4	53	27-97	5	0-30
106-46-7	MSD 1,4-Dichlorobenzene	106	0.00	U 57.0	54	28-97	8	0-30
95-50-1	MSD 1,2-Dichlorobenzene	106	0.00	U 58.3	55	28-99	8	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)ether	106	0.00	U 71.0	67	32-127	4	0-30
100-51-6	MSD Benzyl alcohol	106	0.00	U 70.2	66	37-116	5	0-30
95-48-7	MSD o-Cresol	106	0.00	U 66.6	63	34-109	0	0-30
65794-96-9	MSD m,p-Cresols	106	0.00	U 74.1	70	36-120	5	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	106	0.00	U 68.3	64	42-118	2	0-30
67-72-1	MSD Hexachloroethane	106	0.00	U 55.7	52	29-94	7	0-30
98-95-3	MSD Nitrobenzene	106	0.00	U 72.1	68	38-123	4	0-30
78-59-1	MSD Isophorone	106	0.00	U 71.6	67	43-120	4	0-30
88-75-5	MSD 2-Nitrophenol	106	0.00	U 75.9	71	39-115	6	0-30
105-67-9	MSD 2,4-Dimethylphenol	106	0.00	U 60.1	57	39-107	0	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	106	0.00	U 73.0	69	42-118	3	0-30
120-83-2	MSD 2,4-Dichlorophenol	106	0.00	U 74.3	70	40-111	6	0-30
65-85-0	MSD Benzoic acid	213	0.00	U 120	57	17-95	5	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-148918MSD

Matrix: W

Lab Sample ID 1203937917

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	106	0.00 U	86.5	81	44-138	2	0-30
87-68-3	MSD Hexachlorobutadiene	106	0.00 U	58.4	55	26-98	10	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00 U	79.9	75	41-122	0	0-30
91-57-6	MSD 2-Methylnaphthalene	106	0.00 U	60.9	57	29-109	2	0-30
91-20-3	MSD Naphthalene	106	0.00 U	61.7	58	31-108	4	0-30
90-12-0	MSD 1-Methylnaphthalene	106	0.00 U	63.6	60	33-112	1	0-30
77-47-4	MSD Hexachlorocyclopentadiene	106	0.00 U	44.3	42	26-79	7	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	106	0.00 U	76.5	72	39-124	2	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	106	0.00 U	79.0	74	42-120	1	0-30
91-58-7	MSD 2-Chloronaphthalene	106	0.00 U	63.4	60	29-113	0	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	106	0.00 U	77.2	73	41-121	1	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	106	0.00 U	102	96	42-144	5	0-30
131-11-3	MSD Dimethylphthalate	106	0.00 U	83.4	78	45-128	4	0-30
606-20-2	MSD 2,6-Dinitrotoluene	106	0.00 U	83.9	79	46-124	3	0-30
121-14-2	MSD 2,4-Dinitrotoluene	106	0.00 U	82.0	77	45-125	1	0-30
208-96-8	MSD Acenaphthylene	106	0.00 U	71.0	67	35-120	1	0-30
83-32-9	MSD Acenaphthene	106	0.00 U	74.1	70	35-117	4	0-30
51-28-5	MSD 2,4-Dinitrophenol	106	0.00 U	73.0	69	27-122	6	0-30
132-64-9	MSD Dibenzofuran	106	0.00 U	73.3	69	38-113	1	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	106	0.00 U	82.9	78	40-128	4	0-30
84-66-2	MSD Diethylphthalate	106	0.00 U	83.4	78	43-127	5	0-30
100-02-7	MSD 4-Nitrophenol	106	0.00 U	44.3	42	17-85	3	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-148918MSD

Matrix: W

Lab Sample ID 1203937917

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	106	0.00 U	74.3	70	39-117	2	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	106	0.00 U	75.1	71	39-121	3	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	106	0.00 U	83.1	78	30-133	6	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	106	0.00 U	75.1	71	32-126	7	0-30
122-39-4	MSD Diphenylamine	106	0.00 U	66.9	63	37-118	10	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	106	0.00 U	65.0	61	38-120	9	0-30
101-55-3	MSD 4-Bromophenylphenylether	106	0.00 U	72.9	68	39-121	5	0-30
118-74-1	MSD Hexachlorobenzene	106	0.00 U	69.1	65	40-118	11	0-30
87-86-5	MSD Pentachlorophenol	106	0.00 U	83.7	79	35-121	3	0-30
85-01-8	MSD Phenanthrene	106	0.00 U	68.9	65	40-115	10	0-30
120-12-7	MSD Anthracene	106	0.00 U	69.3	65	38-120	8	0-30
84-74-2	MSD Di-n-butylphthalate	106	0.00 U	70.5	66	41-128	12	0-30
206-44-0	MSD Fluoranthene	106	0.00 U	75.1	71	41-119	8	0-30
129-00-0	MSD Pyrene	106	0.00 U	65.0	61	35-128	13	0-30
85-68-7	MSD Butylbenzylphthalate	106	0.00 U	72.1	68	40-129	7	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	106	0.00 U	67.7	64	38-131	6	0-30
56-55-3	MSD Benzo(a)anthracene	106	0.00 U	72.5	68	39-120	9	0-30
218-01-9	MSD Chrysene	106	0.00 U	71.4	67	41-124	9	0-30
117-84-0	MSD Di-n-octylphthalate	106	0.00 U	65.6	62	37-134	3	0-30
205-99-2	MSD Benzo(b)fluoranthene	106	0.00 U	70.7	66	31-122	8	0-30
207-08-9	MSD Benzo(k)fluoranthene	106	0.00 U	76.0	71	33-123	7	0-30
50-32-8	MSD Benzo(a)pyrene	106	0.00 U	69.0	65	32-118	8	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2018-1240

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-18-148918MSD

Matrix: W

Lab Sample ID 1203937917

Instrument: MSD1.I

Analysis Date: 12/18/2017 16:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1725968

Inj. Vol: 1 uL

Batch ID: 1725973

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	106	0.00 U	64.7	61	27-121	13	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	106	0.00 U	69.8	66	30-125	8	0-30
191-24-2	MSD Benzo(ghi)perylene	106	0.00 U	67.0	63	24-126	9	0-30
123-91-1	MSD 1,4-Dioxane	106	0.00 U	68.7	65	24-110	4	0-30
930-55-2	MSD N-Nitrosopyrrolidine	106	0.00 U	83.9	79	47-119	1	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	106	0.00 U	77.8	73	32-101	2	0-30
1912-24-9	MSD Atrazine	106	0.00 U	92.6	87	42-129	16	0-30
92-87-5	MSD Benzidine	213	0.00 U	106	50	15-130	126 *	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	106	0.00 U	79.0	74	34-124	1	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	106	0.00 U	60.3	57	26-102	3	0-30

## Method Blank Summary

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SDG Number:	2018-1240	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1725968	Instrument ID:	MSD1.I	Data File:	s121817.B\s111807.D
Lab Sample ID:	1203937914	Prep Date:	12/14/2017 18:07	Analyzed:	12/18/17 12:51
Column:	25x.20x.33				

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 1725968	1203937915	s121717.B\s111708.D	12/17/17	1411
02 LCSD for batch 1725968	1203937918	s121717.B\s111709.D	12/17/17	1447
03 CAWA-18-148918	439936001	s121817.B\s111812.D	12/18/17	1531
04 CAWA-18-148918MS	1203937916	s121817.B\s111813.D	12/18/17	1602
05 CAWA-18-148918MSD	1203937917	s121817.B\s111814.D	12/18/17	1633
06 CAWA-18-148943	439936004	s121817.B\s111815.D	12/18/17	1705
07 CAWA-18-150367	439936008	s121817.B\s111816.D	12/18/17	1736



# Quality Control Data

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 1203937914

Client Sample: QC for batch 1725968

Client ID: MB for batch 1725968

Batch ID: 1725973

Run Date: 12/18/2017 12:51

Prep Date: 12/14/2017 18:07

Data File: s121817.B\s111807.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.00	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	3.00	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
122-66-7	Azobenzene	U	3.00	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	3.00	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.00	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	3.00	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	3.00	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	3.00	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	3.00	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	5.00	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	0.410	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	3.00	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.00	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	3.00	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	3.00	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	3.00	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	3.00	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.30	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	3.00	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	3.00	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	0.300	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	0.300	ug/L	0.300	1.00
62-53-3	Aniline	U	4.20	ug/L	4.20	10.0
120-12-7	Anthracene	U	0.300	ug/L	0.300	1.00
1912-24-9	Atrazine	U	3.00	ug/L	3.00	10.0
92-87-5	Benzidine	U	3.90	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	0.300	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	0.300	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	0.300	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	0.300	ug/L	0.300	1.00

**Semi-Volatile  
Certificate of Analysis  
Sample Summary**

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937914  
**Client Sample:** QC for batch 1725968  
**Client ID:** MB for batch 1725968  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 12:51  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111807.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 1000 mL  
**Column:** 25x.20x.33

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.300	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	6.00	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	3.00	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	3.00	ug/L	3.00	10.0
218-01-9	Chrysene	U	0.300	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	3.00	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	3.00	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	0.300	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	3.00	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	3.00	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	3.00	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	3.00	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	0.300	ug/L	0.300	1.00
86-73-7	Fluorene	U	0.300	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	3.00	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	3.00	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	3.00	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	3.00	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.300	ug/L	0.300	1.00
78-59-1	Isophorone	U	3.50	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.00	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine	U	3.00	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.00	ug/L	3.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	3.00	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	3.00	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	0.300	ug/L	0.300	1.00
108-95-2	Phenol	U	3.00	ug/L	3.00	10.0
129-00-0	Pyrene	U	0.300	ug/L	0.300	1.00
110-86-1	Pyridine	U	3.00	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.00	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	3.00	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	3.00	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.00	ug/L	3.00	10.0

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<b>SDG Number:</b> 2018-1240	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203937914	
<b>Client Sample:</b> QC for batch 1725968	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1725968	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1725973	<b>Inst:</b> MSD1.I
<b>Run Date:</b> 12/18/2017 12:51	<b>Analyst:</b> JMB3
<b>Prep Date:</b> 12/14/2017 18:07	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s121817.B\s111807.D	<b>Column:</b> 25x.20x.33
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-009
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 1 uL
	<b>Final Volume:</b> 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	70.3	100	ug/L	70	(32%-124%)
2-Fluorobiphenyl	22.1	50.0	ug/L	44	(32%-112%)
2-Fluorophenol	35.9	100	ug/L	36	(15%-88%)
Nitrobenzene-d5	31.9	50.0	ug/L	64	(36%-115%)
Phenol-d5	21.5	100	ug/L	21	(15%-91%)
p-Terphenyl-d14	37.9	50.0	ug/L	76	(36%-121%)

**Tentatively Identified Compound Summary**

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

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937915  
**Client Sample:** QC for batch 1725968  
**Client ID:** LCS for batch 1725968  
**Batch ID:** 1725973  
**Run Date:** 12/17/2017 14:11  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121717.B\s111708.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** LOF  
**Aliquot:** 1000 mL  
**Column:** 25x.20x.33

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		29.3	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		22.9	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		21.3	ug/L	3.00	10.0
122-66-7	Azobenzene		29.1	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		20.4	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		20.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		20.2	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		24.3	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		35.1	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		31.3	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		31.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		28.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		22.4	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		32.6	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		35.9	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		34.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		24.5	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		26.3	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		35.0	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		23.8	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		29.4	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		37.1	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		30.8	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		31.0	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		36.8	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		31.1	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		11.2	ug/L	3.00	10.0
83-32-9	Acenaphthene		29.7	ug/L	0.300	1.00
208-96-8	Acenaphthylene		28.2	ug/L	0.300	1.00
62-53-3	Aniline		27.6	ug/L	4.20	10.0
120-12-7	Anthracene		31.6	ug/L	0.300	1.00
1912-24-9	Atrazine		43.1	ug/L	3.00	10.0
92-87-5	Benzidine		72.1	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		34.2	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		32.1	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		33.5	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		27.5	ug/L	0.300	1.00

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937915  
**Client Sample:** QC for batch 1725968  
**Client ID:** LCS for batch 1725968  
**Batch ID:** 1725973  
**Run Date:** 12/17/2017 14:11  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121717.B\s111708.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** LOF  
**Aliquot:** 1000 mL  
**Column:** 25x.20x.33

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		35.5	ug/L	0.300	1.00
65-85-0	Benzoic acid		29.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		23.8	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		33.3	ug/L	3.00	10.0
218-01-9	Chrysene		33.2	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		33.9	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		30.6	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		30.5	ug/L	0.300	1.00
132-64-9	Dibenzofuran		29.3	ug/L	3.00	10.0
84-66-2	Diethylphthalate		35.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		34.6	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		29.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		34.3	ug/L	0.300	1.00
86-73-7	Fluorene		30.9	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		31.2	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		21.3	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		20.9	ug/L	3.00	10.0
67-72-1	Hexachloroethane		20.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		28.3	ug/L	0.300	1.00
78-59-1	Isophorone		28.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		15.5	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		27.1	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		32.0	ug/L	3.00	10.0
91-20-3	Naphthalene		23.6	ug/L	0.300	1.00
98-95-3	Nitrobenzene		27.6	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		37.8	ug/L	3.00	10.0
85-01-8	Phenanthrene		32.0	ug/L	0.300	1.00
108-95-2	Phenol		10.7	ug/L	3.00	10.0
129-00-0	Pyrene		31.0	ug/L	0.300	1.00
110-86-1	Pyridine		17.3	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		27.7	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		28.9	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		28.5	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		32.1	ug/L	3.00	10.0

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937915  
**Client Sample:** QC for batch 1725968  
**Client ID:** LCS for batch 1725968  
**Batch ID:** 1725973  
**Run Date:** 12/17/2017 14:11  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121717.B\s111708.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** LOF  
**Aliquot:** 1000 mL  
**Column:** 25x.20x.33

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		24.5	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		42.9	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		23.9	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		32.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		35.9	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	71.3	100	ug/L	71	(32%-124%)
2-Fluorobiphenyl	22.4	50.0	ug/L	45	(32%-112%)
2-Fluorophenol	31.8	100	ug/L	32	(15%-88%)
Nitrobenzene-d5	27.8	50.0	ug/L	56	(36%-115%)
Phenol-d5	20.4	100	ug/L	20	(15%-91%)
p-Terphenyl-d14	33.9	50.0	ug/L	68	(36%-121%)

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937916  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MS  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:02  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111813.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		76.4	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		58.7	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		54.0	ug/L	6.38	21.3
122-66-7	Azobenzene		71.1	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		53.4	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		52.6	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		65.7	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		63.0	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		86.4	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		79.6	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		78.0	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		70.3	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		60.3	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		68.9	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		83.2	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		86.8	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		63.4	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		67.1	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		80.5	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		59.9	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		71.2	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		79.6	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		76.3	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		79.9	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		88.6	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		77.2	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		43.0	ug/L	6.38	21.3
83-32-9	Acenaphthene		76.7	ug/L	0.638	2.13
208-96-8	Acenaphthylene		71.8	ug/L	0.638	2.13
62-53-3	Aniline		53.2	ug/L	8.94	21.3
120-12-7	Anthracene		75.2	ug/L	0.638	2.13
1912-24-9	Atrazine		109	ug/L	6.38	21.3
92-87-5	Benzidine		24.0	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		79.6	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		74.7	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		76.3	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		73.2	ug/L	0.638	2.13



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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937916  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MS  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:02  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111813.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		81.3	ug/L	0.638	2.13
65-85-0	Benzoic acid		114	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		66.9	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		77.0	ug/L	6.38	21.3
218-01-9	Chrysene		78.0	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		79.4	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		67.7	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		75.5	ug/L	0.638	2.13
132-64-9	Dibenzofuran		74.2	ug/L	6.38	21.3
84-66-2	Diethylphthalate		87.6	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		86.4	ug/L	6.38	21.3
88-85-7	Dinoseb	U	6.38	ug/L	6.38	21.3
122-39-4	Diphenylamine		73.6	ug/L	6.38	21.3
206-44-0	Fluoranthene		81.0	ug/L	0.638	2.13
86-73-7	Fluorene		75.5	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		77.5	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		53.0	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		41.4	ug/L	6.38	21.3
67-72-1	Hexachloroethane		51.7	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		74.1	ug/L	0.638	2.13
78-59-1	Isophorone		68.8	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		53.4	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.38	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	6.38	ug/L	6.38	21.3
621-64-7	N-Nitrosodi-n-propylamine		67.1	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		85.1	ug/L	6.38	21.3
91-20-3	Naphthalene		59.4	ug/L	0.638	2.13
98-95-3	Nitrobenzene		68.9	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	6.38	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		86.6	ug/L	6.38	21.3
85-01-8	Phenanthrene		76.1	ug/L	0.638	2.13
108-95-2	Phenol		42.5	ug/L	6.38	21.3
129-00-0	Pyrene		73.8	ug/L	0.638	2.13
110-86-1	Pyridine		23.6	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		68.1	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		71.1	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		67.6	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		72.2	ug/L	6.38	21.3

**Semi-Volatile  
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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937916  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MS  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:02  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111813.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		70.7	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		107	ug/L	6.38	21.3
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol		66.8	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		76.7	ug/L	6.38	21.3
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline		88.1	ug/L	6.38	21.3
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	176	213	ug/L	83	(32%-124%)
2-Fluorobiphenyl	63.0	106	ug/L	59	(32%-112%)
2-Fluorophenol	106	213	ug/L	50	(15%-88%)
Nitrobenzene-d5	67.7	106	ug/L	64	(36%-115%)
Phenol-d5	78.7	213	ug/L	37	(15%-91%)
p-Terphenyl-d14	84.1	106	ug/L	79	(36%-121%)

**Semi-Volatile  
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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937917  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MSD  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:33  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111814.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		77.8	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		60.3	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		58.3	ug/L	6.38	21.3
122-66-7	Azobenzene		65.0	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		56.4	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		57.0	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		68.7	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		63.6	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		82.9	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		79.0	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		76.5	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		74.3	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		60.1	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		73.0	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		82.0	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		83.9	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		63.4	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		68.3	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		75.1	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		60.9	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		75.9	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		79.0	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		72.9	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		79.9	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		86.5	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		75.1	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		44.3	ug/L	6.38	21.3
83-32-9	Acenaphthene		74.1	ug/L	0.638	2.13
208-96-8	Acenaphthylene		71.0	ug/L	0.638	2.13
62-53-3	Aniline		61.9	ug/L	8.94	21.3
120-12-7	Anthracene		69.3	ug/L	0.638	2.13
1912-24-9	Atrazine		92.6	ug/L	6.38	21.3
92-87-5	Benzidine		106	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		72.5	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		69.0	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		70.7	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		67.0	ug/L	0.638	2.13

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937917  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MSD  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:33  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111814.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		76.0	ug/L	0.638	2.13
65-85-0	Benzoic acid		120	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		70.2	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		72.1	ug/L	6.38	21.3
218-01-9	Chrysene		71.4	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		70.5	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		65.6	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		69.8	ug/L	0.638	2.13
132-64-9	Dibenzofuran		73.3	ug/L	6.38	21.3
84-66-2	Diethylphthalate		83.4	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		83.4	ug/L	6.38	21.3
88-85-7	Dinoseb	U	6.38	ug/L	6.38	21.3
122-39-4	Diphenylamine		66.9	ug/L	6.38	21.3
206-44-0	Fluoranthene		75.1	ug/L	0.638	2.13
86-73-7	Fluorene		74.3	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		69.1	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		58.4	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		44.3	ug/L	6.38	21.3
67-72-1	Hexachloroethane		55.7	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		64.7	ug/L	0.638	2.13
78-59-1	Isophorone		71.6	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		48.6	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.38	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	6.38	ug/L	6.38	21.3
621-64-7	N-Nitrosodi-n-propylamine		68.3	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		83.9	ug/L	6.38	21.3
91-20-3	Naphthalene		61.7	ug/L	0.638	2.13
98-95-3	Nitrobenzene		72.1	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	6.38	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		83.7	ug/L	6.38	21.3
85-01-8	Phenanthrene		68.9	ug/L	0.638	2.13
108-95-2	Phenol		43.8	ug/L	6.38	21.3
129-00-0	Pyrene		65.0	ug/L	0.638	2.13
110-86-1	Pyridine		45.3	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		71.0	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		73.0	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		70.9	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		67.7	ug/L	6.38	21.3

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**SDG Number:** 2018-1240  
**Lab Sample ID:** 1203937917  
**Client Sample:** QC for batch 1725968  
**Client ID:** CAWA-18-148918MSD  
**Batch ID:** 1725973  
**Run Date:** 12/18/2017 16:33  
**Prep Date:** 12/14/2017 18:07  
**Data File:** s121817.B\s111814.D

**Date Collected:** 12/11/2017 10:31  
**Date Received:** 12/13/2017 09:20  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD1.I  
**Analyst:** JMB3  
**Aliquot:** 470 mL  
**Column:** 25x.20x.33

**Matrix:** W  
**Project:** QC  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		74.1	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		102	ug/L	6.38	21.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		66.6	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		77.2	ug/L	6.38	21.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		83.1	ug/L	6.38	21.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	167	213	ug/L	79	(32%-124%)
2-Fluorobiphenyl	67.0	106	ug/L	63	(32%-112%)
2-Fluorophenol	106	213	ug/L	50	(15%-88%)
Nitrobenzene-d5	70.6	106	ug/L	66	(36%-115%)
Phenol-d5	81.1	213	ug/L	38	(15%-91%)
p-Terphenyl-d14	74.6	106	ug/L	70	(36%-121%)

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Sample Summary**

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SDG Number: 2018-1240

Lab Sample ID: 1203937918

Client Sample: QC for batch 1725968

Client ID: LCSD for batch 1725968

Batch ID: 1725973

Run Date: 12/17/2017 14:47

Prep Date: 12/14/2017 18:07

Data File: s121717.B\s111709.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: LOF

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		30.7	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		25.4	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		23.2	ug/L	3.00	10.0
122-66-7	Azobenzene		29.7	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		23.1	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		22.6	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		22.1	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		26.7	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		34.8	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		33.5	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		31.2	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		31.7	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		27.4	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		32.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		35.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		35.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		25.5	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		28.5	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		35.1	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		25.0	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		29.4	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		36.5	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		31.9	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		32.8	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		38.9	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		31.9	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		10.3	ug/L	3.00	10.0
83-32-9	Acenaphthene		30.8	ug/L	0.300	1.00
208-96-8	Acenaphthylene		28.9	ug/L	0.300	1.00
62-53-3	Aniline		29.2	ug/L	4.20	10.0
120-12-7	Anthracene		32.6	ug/L	0.300	1.00
1912-24-9	Atrazine		44.6	ug/L	3.00	10.0
92-87-5	Benzidine		69.1	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		34.4	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		33.0	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		33.1	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		33.0	ug/L	0.300	1.00

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SDG Number: 2018-1240

Lab Sample ID: 1203937918

Client Sample: QC for batch 1725968

Client ID: LCSD for batch 1725968

Batch ID: 1725973

Run Date: 12/17/2017 14:47

Prep Date: 12/14/2017 18:07

Data File: s121717.B\s111709.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: LOF

Aliquot: 1000 mL

Column: 25x.20x.33

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		35.9	ug/L	0.300	1.00
65-85-0	Benzoic acid		30.4	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		26.6	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		33.4	ug/L	3.00	10.0
218-01-9	Chrysene		33.4	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		34.4	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		30.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		34.3	ug/L	0.300	1.00
132-64-9	Dibenzofuran		30.2	ug/L	3.00	10.0
84-66-2	Diethylphthalate		36.3	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		36.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		30.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		34.9	ug/L	0.300	1.00
86-73-7	Fluorene		31.0	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		33.2	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		23.9	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.9	ug/L	3.00	10.0
67-72-1	Hexachloroethane		22.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		33.0	ug/L	0.300	1.00
78-59-1	Isophorone		30.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		16.8	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		28.2	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		34.0	ug/L	3.00	10.0
91-20-3	Naphthalene		25.5	ug/L	0.300	1.00
98-95-3	Nitrobenzene		30.3	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		37.8	ug/L	3.00	10.0
85-01-8	Phenanthrene		32.3	ug/L	0.300	1.00
108-95-2	Phenol		11.2	ug/L	3.00	10.0
129-00-0	Pyrene		31.7	ug/L	0.300	1.00
110-86-1	Pyridine		18.9	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		28.9	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		31.6	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		30.7	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		32.8	ug/L	3.00	10.0

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<b>SDG Number:</b> 2018-1240	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203937918	
<b>Client Sample:</b> QC for batch 1725968	<b>Client:</b> ARSL004
<b>Client ID:</b> LCSD for batch 1725968	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1725973	<b>Inst:</b> MSD1.I
<b>Run Date:</b> 12/17/2017 14:47	<b>Analyst:</b> LOF
<b>Prep Date:</b> 12/14/2017 18:07	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s121717.B\s111709.D	<b>Column:</b> 25x.20x.33
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-009
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 1 uL
	<b>Final Volume:</b> 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		25.5	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		42.7	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		24.8	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		33.1	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		35.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	69.8	100	ug/L	70	(32%-124%)
2-Fluorobiphenyl	23.8	50.0	ug/L	48	(32%-112%)
2-Fluorophenol	33.7	100	ug/L	34	(15%-88%)
Nitrobenzene-d5	29.0	50.0	ug/L	58	(36%-115%)
Phenol-d5	20.3	100	ug/L	20	(15%-91%)
p-Terphenyl-d14	33.9	50.0	ug/L	68	(36%-121%)



# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2018-1240  
Work Order #: 439936**

**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:                    1727162

Prep Batch Number:                    1727161

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
439936006	439936006 (CAWA-18-150366)
439936009	439936009 (CAWA-18-150418)
439936010	439936010 (CAWA-18-150419)
1203940856	Interference Check Sample (ICS)
1203940852	Method Blank (MB)
1203940853	Laboratory Control Sample (LCS)
1203940854	439940001(CALA-18-150103) Matrix Spike (MS)
1203940855	439940001(CALA-18-150103) 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.

### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

### **Interference Check Sample (ICS)**

The ICS spike recoveries met the acceptance criteria.

### **QC Sample Designation**

Client sample 439940001 (CALA-18-150103) was chosen for matrix spike and matrix spike duplicate analysis.

### **Matrix Spike (MS) Recovery Statement**

The MS recoveries were within the established acceptance limits.

### **MS/MSD Relative Percent Difference (RPD) Statement**

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

### **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**

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

##### **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: 2018-1240 GEL Work Order: 439936

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

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, 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: 22 DEC 2017

Title: Group Leader

# **Sample Data Summary**



## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-150366Date Received: 13-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 439936006Date Filtered: 18-DEC-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	0.256	ug/L		1	19-DEC-17 16:19	per1219016a
	Perchlorate Isotope Ratio			2.93			1	19-DEC-17 16:19	per1219016a
14797-73-0	Perchlorate-101	.05	.2	0.257	ug/L		1	19-DEC-17 16:19	per1219016a
	Perchlorate-O(18)			0.503	ug/L		1	19-DEC-17 16:19	per1219016a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-150418Date Received: 13-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 439936009Date Filtered: 18-DEC-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	0.259	ug/L		1	19-DEC-17 16:28	per1219017a
	Perchlorate Isotope Ratio			2.99			1	19-DEC-17 16:28	per1219017a
14797-73-0	Perchlorate-101	.05	.2	0.254	ug/L		1	19-DEC-17 16:28	per1219017a
	Perchlorate-O(18)			0.484	ug/L		1	19-DEC-17 16:28	per1219017a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-18-150419Date Received: 13-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 439936010Date Filtered: 18-DEC-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	0.266	ug/L		1	19-DEC-17 16:36	per1219018a
	Perchlorate Isotope Ratio			3			1	19-DEC-17 16:36	per1219018a
14797-73-0	Perchlorate-101	.05	.2	0.261	ug/L		1	19-DEC-17 16:36	per1219018a
	Perchlorate-O(18)			0.483	ug/L		1	19-DEC-17 16:36	per1219018a

^ 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):** 2018-1240

**Extract Batch Code:** 1727161

**Date Filtered:** 18-DEC-17

**Matrix:** WATER

**Sample ID:** 1203940853

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.196	ug/L	98		85 - 115
Perchlorate Isotope Ratio		3.03				-
Perchlorate-101	0.200	.19	ug/L	95		85 - 115
Perchlorate-O(18)		.461	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):** 2018-1240

**Extract Batch Code:** 1727161

**Date Extracted:** 18-DEC-17

**GEL MS/PS ID:** 1203940854

**Client ID:** CALA-18-150103

**GEL MSD/PSD ID:** 1203940855

**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	0.445	ug/L	0.626	91	.64	97	2	30	75 - 125
Perchlorate Isotope Ratio	0	3.12		3.03		3.05		1		-
Perchlorate-101	0.200	0.419	ug/L	0.607	94	.617	99	2	30	75 - 125
Perchlorate-O(18)	0	0.476	ug/L	0.457		.465		2		-

^ 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 LLC

Client Sample No.

MBLab Code: GELDate Received: 18-DEC-17Instrument: LCMSMSGEL Job No (SDG): 2018-1240Method: EPA 6850 ModifiedGEL Sample ID: 1203940852Matrix: WATERDate Filtered: 18-DEC-17Extraction Batch ID: 1727161Injection Volume (uL): 20Extraction Type: Filter/DAISample 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	0.050	ug/L	U	1	19-DEC-17 15:52	per1219013a
	Perchlorate Isotope Ratio						1	19-DEC-17 15:52	per1219013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	19-DEC-17 15:52	per1219013a
	Perchlorate-O(18)			0.498	ug/L		1	19-DEC-17 15:52	per1219013a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 18-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 1203940853Date Filtered: 18-DEC-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	0.196	ug/L	J	1	19-DEC-17 16:01	per1219014a
	Perchlorate Isotope Ratio			3.03			1	19-DEC-17 16:01	per1219014a
14797-73-0	Perchlorate-101	.05	.2	0.190	ug/L	J	1	19-DEC-17 16:01	per1219014a
	Perchlorate-O(18)			0.461	ug/L		1	19-DEC-17 16:01	per1219014a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-1240GEL Sample ID: 1203940856Date Filtered: 18-DEC-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	0.228	ug/L		1	19-DEC-17 16:10	per1219015a
	Perchlorate Isotope Ratio			3.01			1	19-DEC-17 16:10	per1219015a
14797-73-0	Perchlorate-101	.05	.2	0.223	ug/L		1	19-DEC-17 16:10	per1219015a
	Perchlorate-O(18)			0.492	ug/L		1	19-DEC-17 16:10	per1219015a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-18-150103MSDate Received: 13-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 1203940854Date Filtered: 18-DEC-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	0.626	ug/L		1	19-DEC-17 16:54	per1219020a
	Perchlorate Isotope Ratio			3.03			1	19-DEC-17 16:54	per1219020a
14797-73-0	Perchlorate-101	.05	.2	0.607	ug/L		1	19-DEC-17 16:54	per1219020a
	Perchlorate-O(18)			0.457	ug/L		1	19-DEC-17 16:54	per1219020a

^ 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: 1727161Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-18-150103MSDDate Received: 13-DEC-17GEL Job No (SDG): 2018-1240GEL Sample ID: 1203940855Date Filtered: 18-DEC-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	0.640	ug/L		1	19-DEC-17 17:03	per1219021a
	Perchlorate Isotope Ratio			3.05			1	19-DEC-17 17:03	per1219021a
14797-73-0	Perchlorate-101	.05	.2	0.617	ug/L		1	19-DEC-17 17:03	per1219021a
	Perchlorate-O(18)			0.465	ug/L		1	19-DEC-17 17:03	per1219021a

^ 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 #: 2018-1240  
Work Order #: 439936**

**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: 1726272

Prep Batch Number: 1726271

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936002	CAWA-18-148918
439936005	CAWA-18-148943
439936007	CAWA-18-150367
1203938677	Method Blank (MB)
1203938678	Laboratory Control Sample (LCS)
1203938679	439826001(CAWA-18-148902) Matrix Spike (MS)
1203938680	439826001(CAWA-18-148902) 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 439826001 (CAWA-18-148902) was chosen for matrix spike and matrix spike duplicate analysis.

##### **Matrix Spike (MS) Recovery Statement**

The MS spike recoveries were within the established acceptance limits for this analysis.

##### **MS/MSD Relative Percent Difference (RPD) Statement**

The RPDs between the MS and MSD met the acceptance limits for this analysis.

##### **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. Samples 439936002 (CAWA-18-148918), 439936005 (CAWA-18-148943) and 439936007 (CAWA-18-150367) were further diluted to bring the over range concentrations within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

Analyte	439936		
	002	005	007
RDX	5X	5X	5X



**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 2.0 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 LCMSMS.

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: 2018-1240 GEL Work Order: 439936

#### 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: 21 DEC 2017

Title: Group Leader

# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148918

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936002

Sample Amount 940 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215031.wiff

Date Analyzed: 16-DEC-17 09:43

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>				
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>				
99-35-4	1,3,5-Trinitrobenzene	.0851	U	0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148918

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936002

Sample Amount 940 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-18-148918

**Lab Code:** GEL

**GEL Job No (SDG)** 2018-1240

**Matrix:** WATER

**GEL Sample ID:** 439936002

**Sample Amount** 940 mL

**Date Received:** 13-DEC-17

**Moisture:** .

**Extraction Batch ID:** 1726271

**Extraction Type** Sol Exchange

**Date Extracted:** 14-DEC-17

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1218031.wiff

**Date Analyzed:** 19-DEC-17 06:27

**Dilution Factor:** 5

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	13.7		0.213	0.665
121-82-4	RDX				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148943

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936005

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215032.wiff

Date Analyzed: 16-DEC-17 10:18

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.086	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.086	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.086	U	0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.086	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.086	U	0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.086	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.086	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.086	U	0.086	0.269
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.086	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.086	U	0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.086	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.086	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.086	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148943

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936005

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.086	U	0.086	0.269
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0882	U	0.0882	0.269
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.108	U	0.108	0.538
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.161	U	0.161	0.538
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.323	U	0.323	1.08
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.323	U	0.323	1.08
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.323	U	0.323	1.08
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.538	U	0.538	2.69
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.538	U	0.538	2.69
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				



1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-18-148943

**Lab Code:** GEL

**GEL Job No (SDG)** 2018-1240

**Matrix:** WATER

**GEL Sample ID:** 439936005

**Sample Amount** 930 mL

**Date Received:** 13-DEC-17

**Moisture:** .

**Extraction Batch ID:** 1726271

**Extraction Type** Sol Exchange

**Date Extracted:** 14-DEC-17

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1218032.wiff

**Date Analyzed:** 19-DEC-17 07:02

**Dilution Factor:** 5

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	14.1		0.215	0.672
121-82-4	RDX				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-150367

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936007

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215037.wiff

Date Analyzed: 16-DEC-17 13:13

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.086	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.086	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.086	U	0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.086	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.086	U	0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.086	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.086	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.086	U	0.086	0.269
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.086	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.086	U	0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.086	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.086	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.086	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-150367

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 439936007

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.086	U	0.086	0.269
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0882	U	0.0882	0.269
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.108	U	0.108	0.538
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.161	U	0.161	0.538
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.323	U	0.323	1.08
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.323	U	0.323	1.08
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.323	U	0.323	1.08
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.538	U	0.538	2.69
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.538	U	0.538	2.69
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-18-150367

**Lab Code:** GEL

**GEL Job No (SDG)** 2018-1240

**Matrix:** WATER

**GEL Sample ID:** 439936007

**Sample Amount** 930 mL

**Date Received:** 13-DEC-17

**Moisture:** .

**Extraction Batch ID:** 1726271

**Extraction Type** Sol Exchange

**Date Extracted:** 14-DEC-17

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP1218033.wiff

**Date Analyzed:** 19-DEC-17 07:37

**Dilution Factor:** 5

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	15.6		0.215	0.672
121-82-4	RDX				

# **Quality Control Summary**

## High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2018-1240Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
439936002	CAWA-18-148918	91	55 - 115	
439936002	CAWA-18-148918DL	86	55 - 115	
439936005	CAWA-18-148943	85	55 - 115	
439936005	CAWA-18-148943DL	92	55 - 115	
439936007	CAWA-18-150367	89	55 - 115	
439936007	CAWA-18-150367DL	91	55 - 115	
1203938677	MB for batch 1726271	100	55 - 115	
1203938678	LCS for batch 1726271	83	55 - 115	
1203938679	CAWA-18-148902MS	91	55 - 115	
1203938680	CAWA-18-148902MSD	96	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)** 2018-1240

**Extract Batch Code:** 1726271

**Date Extracted:** 14-DEC-17

**GEL LCS ID:** 1203938678

**GEL LCSDUP ID:** .

**Analysis Date/Time:** 16-DEC-17 06:12

**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	4.24	85					70 - 110
2,4,6-Trinitrotoluene	5	4.58	92					69 - 113
2,4-Diamino-6-nitrotoluene	5	5.28	106					50 - 121
2,4-Dinitrotoluene	5	4.92	98					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.52	90					53 - 127
2,6-Dinitrotoluene	5	4.43	89					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.89	98					70 - 112
3,5-Dinitroaniline	5	4.6	92					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.49	90					74 - 116
DNX	.5	.441	88					65 - 113
HMX	5	4.11	82					58 - 113
MNX	.5	.408	82					66 - 114
Nitrobenzene	5	5.03	101					64 - 115
PETN	5	4.11	82					57 - 126
RDX	5	5.36	107					64 - 117
TATB	3	1.9	63					47 - 135
TNX	.5	.433	87					51 - 110
Tetryl	5	4.25	85					55 - 122
m-Dinitrobenzene	5	4.79	96					74 - 117
m-Nitrotoluene	5	4.92	98					66 - 114
o-Nitrotoluene	5	4.63	93					64 - 115
p-Nitrotoluene	5	4.74	95					66 - 127
tris(o-cresyl) phosphate	5	3.83	77					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-18-148902

**Lab Code:** GEL

**GEL Job No (SDG)** 2018-1240

**Extract Batch Code:** 1726271

**Date Extracted:** 14-DEC-17

**GEL Spike ID:** 1203938679

**GEL SpikeDup ID:** 1203938680

**Analysis Date/Time:** 16-DEC-17 07:22

**MSD Analysis Date/Time:** 16-DEC-17 07:57

**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
1,3,5-Trinitrobenzene	5.31915	0	5.02	94	5.02	93	0	30	67 - 111
2,4,6-Trinitrotoluene	5.31915	0	5.46	103	5.75	107	5	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.31915	0	5.52	104	5.13	95	7	30	50 - 121
2,4-Dinitrotoluene	5.31915	0	5.1	96	5.38	100	5	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.31915	0	5.46	103	5.41	101	1	30	53 - 127
2,6-Dinitrotoluene	5.31915	0	4.82	91	5.25	98	9	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.31915	.0807	5.01	93	5.33	98	6	30	67 - 115
3,5-Dinitroaniline	5.31915	0	4.89	92	5.45	101	11	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.31915	.146	5.38	98	5.67	103	5	30	65 - 120
DNX	.53191	.137	.696	105	.653	96	6	30	53 - 124
HMX	5.31915	1.63	5.66	76	5.88	79	4	30	44 - 128
MXN	.53191	.295	.837	102	.663	69	23	30	60 - 121
Nitrobenzene	5.31915	0	5.1	96	4.26	79	18	30	62 - 116
PETN	5.31915	0	4.14	78	4.25	79	3	30	51 - 131
RDX	5.31915	28	26.7	28 *	27.1	36 *	2	30	57 - 125
TATB	3.19149	0	2.44	76	2.5	77	2	30	38 - 149
TNX	.53191	.246	.796	103	.724	89	9	30	46 - 120
Tetryl	5.31915	0	5.34	100	5.12	95	4	30	50 - 126
m-Dinitrobenzene	5.31915	0	5.16	97	5.24	97	1	30	74 - 117
m-Nitrotoluene	5.31915	0	4.55	85	4.98	93	9	30	59 - 120
o-Nitrotoluene	5.31915	0	5.25	99	3.94	73	29	30	56 - 119
p-Nitrotoluene	5.31915	0	5.35	101	5.49	102	3	30	61 - 129
tris(o-cresyl) phosphate	5.31915	0	4.48	84	4.31	80	4	30	38 - 105

#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 1726271

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938677

Sample Amount 1000 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215024.wiff

Date Analyzed: 16-DEC-17 05:37

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 1726271

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938677

Sample Amount 1000 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-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 1726271

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938678

Sample Amount 1000 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215025.wiff

Date Analyzed: 16-DEC-17 06:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.408		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.433		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.441		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.9		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.83		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	4.11		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
78-11-5	PETN	4.11		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-35-4	1,3,5-Trinitrobenzene	4.24		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
479-45-8	Tetryl	4.25		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	4.43		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.49		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.52		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.58		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1726271

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938678

Sample Amount 1000 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	4.6		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
88-72-2	o-Nitrotoluene	4.63		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.74		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.79		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.89		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.92		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.92		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	5.03		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.28		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	5.36		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148902(439826001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938679

Sample Amount 940 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215027.wiff

Date Analyzed: 16-DEC-17 07:22

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.696		0.0851	0.266
80251-29-2	DNX				
13980-04-6	TNX	.796		0.0851	0.266
13980-04-6	TNX				
5755-27-1	MNX	.837		0.0851	0.266
5755-27-1	MNX				
3058-38-6	TATB	2.44		0.319	1.06
3058-38-6	TATB				
78-11-5	PETN	4.14		0.106	0.532
78-11-5	PETN				
78-30-8	tris(o-cresyl) phosphate	4.48		0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
99-08-1	m-Nitrotoluene	4.55		0.0851	0.266
99-08-1	m-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.82		0.0851	0.266
606-20-2	2,6-Dinitrotoluene				
618-87-1	3,5-Dinitroaniline	4.89		0.319	1.06
618-87-1	3,5-Dinitroaniline				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.01		0.0851	0.266
35572-78-2	2-Amino-4,6-dinitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.02		0.0851	0.266
99-35-4	1,3,5-Trinitrobenzene				
121-14-2	2,4-Dinitrotoluene	5.1		0.0851	0.266
121-14-2	2,4-Dinitrotoluene				
98-95-3	Nitrobenzene	5.1		0.0851	0.266
98-95-3	Nitrobenzene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148902(439826001MS)MS

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938679

Sample Amount 940 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	5.16		0.0851	0.266
99-65-0	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	5.25		0.0872	0.266
88-72-2	<i>o-Nitrotoluene</i>				
479-45-8	Tetryl	5.34		0.0851	0.532
479-45-8	<i>Tetryl</i>				
99-99-0	p-Nitrotoluene	5.35		0.160	0.532
99-99-0	<i>p-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.38		0.0851	0.266
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.46		0.0851	0.266
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.46		0.532	2.66
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.52		0.532	2.66
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	5.66		0.0851	0.266
2691-41-0	<i>HMX</i>				
121-82-4	RDX	26.7		0.0851	0.266
121-82-4	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148902(439826001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938680

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP1215028.wiff

Date Analyzed: 16-DEC-17 07:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.653		0.086	0.269
80251-29-2	DNX				
5755-27-1	MNX	.663		0.086	0.269
5755-27-1	MNX				
13980-04-6	TNX	.724		0.086	0.269
13980-04-6	TNX				
3058-38-6	TATB	2.5		0.323	1.08
3058-38-6	TATB				
88-72-2	o-Nitrotoluene	3.94		0.0882	0.269
88-72-2	o-Nitrotoluene				
78-11-5	PETN	4.25		0.108	0.538
78-11-5	PETN				
98-95-3	Nitrobenzene	4.26		0.086	0.269
98-95-3	Nitrobenzene				
78-30-8	tris(o-cresyl) phosphate	4.31		0.323	1.08
78-30-8	tris(o-cresyl) phosphate				
99-08-1	m-Nitrotoluene	4.98		0.086	0.269
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.02		0.086	0.269
99-35-4	1,3,5-Trinitrobenzene				
479-45-8	Tetryl	5.12		0.086	0.538
479-45-8	Tetryl				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.13		0.538	2.69
6629-29-4	2,4-Diamino-6-nitrotoluene				
99-65-0	m-Dinitrobenzene	5.24		0.086	0.269
99-65-0	m-Dinitrobenzene				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-18-148902(439826001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2018-1240

Matrix: WATER

GEL Sample ID: 1203938680

Sample Amount 930 mL

Date Received: 13-DEC-17

Moisture: .

Extraction Batch ID: 1726271

Extraction Type Sol Exchange

Date Extracted: 14-DEC-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
606-20-2	2,6-Dinitrotoluene	5.25		0.086	0.269
606-20-2	2,6-Dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.33		0.086	0.269
35572-78-2	2-Amino-4,6-dinitrotoluene				
121-14-2	2,4-Dinitrotoluene	5.38		0.086	0.269
121-14-2	2,4-Dinitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.41		0.538	2.69
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	5.45		0.323	1.08
618-87-1	3,5-Dinitroaniline				
99-99-0	p-Nitrotoluene	5.49		0.161	0.538
99-99-0	p-Nitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.67		0.086	0.269
19406-51-0	4-Amino-2,6-dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	5.75		0.086	0.269
118-96-7	2,4,6-Trinitrotoluene				
2691-41-0	HMX	5.88		0.086	0.269
2691-41-0	HMX				
121-82-4	RDX	27.1		0.086	0.269
121-82-4	RDX				

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1240Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-DEC-17 16:09GEL Data File: EXP1215001.wiffInstrument ID: LCMSMS7Column: 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
Nitroglycerin	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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1240Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 15-DEC-17 16:44GEL Data File: EXP1215002.wiffInstrument ID: LCMSMS7Column: 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
Nitroglycerin	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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1240Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 18-DEC-17 12:53GEL Data File: EXP1218001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2018-1240Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 18-DEC-17 13:29GEL Data File: EXP1218002.wiffInstrument ID: LCMSMS7Column: 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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 15-DEC-17 21:25

GEL Data File: EXP1215010.wiff

Instrument ID: LCMSMS7

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
Nitroglycerin	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):** 2018-1240

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 15-DEC-17 23:46

**GEL Data File:** EXP1215014.wiff

**Instrument ID:** LCMSMS7

**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
Nitroglycerin	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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 16-DEC-17 03:17

GEL Data File: EXP1215020.wiff

Instrument ID: LCMSMS7

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
Nitroglycerin	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):** 2018-1240

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 16-DEC-17 04:27

**GEL Data File:** EXP1215022.wiff

**Instrument ID:** LCMSMS7

**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
Nitroglycerin	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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 16-DEC-17 10:53

GEL Data File: EXP1215033.wiff

Instrument ID: LCMSMS7

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
Nitroglycerin	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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 16-DEC-17 12:03

GEL Data File: EXP1215035.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
Nitroglycerin	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

**4A**  
**Explosives Continuing Calibration Blank**

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2018-1240

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 16-DEC-17 14:59

**GEL Data File:** EXP1215040.wiff

**Instrument ID:** LCMSMS7

**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
Nitroglycerin	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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 16-DEC-17 17:54

GEL Data File: EXP1215045.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
Nitroglycerin	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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 16-DEC-17 18:29

GEL Data File: EXP1215046.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 16-DEC-17 19:40

GEL Data File: EXP1215048.wiff

Instrument ID: LCMSMS7

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
Nitroglycerin	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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 18-DEC-17 18:10

GEL Data File: EXP1218010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	2.9
p-Nitrotoluene	0	3.1
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
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	3.3
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	3.7
4-Amino-2,6-dinitrotoluene	0	3.7
HMX	0	4
Nitrobenzene	0	0
PETN	0	0
RDX	0	6.1
Tetryl	0	0



4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 18-DEC-17 20:30

GEL Data File: EXP1218014.wiff

Instrument ID: LCMSMS7

Column: 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	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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 19-DEC-17 04:07

GEL Data File: EXP1218027.wiff

Instrument ID: LCMSMS7

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): 2018-1240

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 19-DEC-17 08:47

GEL Data File: EXP1218035.wiff

Instrument ID: LCMSMS7

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

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2018-1240**  
**Work Order #: 439936**

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203938109	Method Blank (MB) <b>ICP</b>
1203938110	Laboratory Control Sample (LCS)
1203938113	439940001(CALA-18-150103L) Serial Dilution (SD)
1203938111	439940001(CALA-18-150103D) Sample Duplicate (DUP)
1203938112	439940001(CALA-18-150103S) Matrix Spike (MS)
1203938138	Method Blank (MB) <b>ICP-MS</b>
1203949447	Method Blank (MB) <b>ICP-MS</b>
1203938139	Laboratory Control Sample (LCS)
1203949448	Laboratory Control Sample (LCS)
1203938142	439940001(CALA-18-150103L) Serial Dilution (SD)
1203949451	439940001(CALA-18-150103L) Serial Dilution (SD)
1203938140	439940001(CALA-18-150103D) Sample Duplicate (DUP)
1203949449	439940001(CALA-18-150103D) Sample Duplicate (DUP)
1203938141	439940001(CALA-18-150103S) Matrix Spike (MS)
1203949450	439940001(CALA-18-150103S) Matrix Spike (MS)
1203947440	Method Blank (MB) <b>CVAA</b>
1203947441	Laboratory Control Sample (LCS)
1203947447	439936001(CAWA-18-148918L) Serial Dilution (SD)
1203947443	439936001(CAWA-18-148918D) Sample Duplicate (DUP)
1203947445	439936001(CAWA-18-148918S) Matrix Spike (MS)

**Sample Analysis**

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

**Method/Analysis Information**

<b>Analytical Batch:</b>	1726059, 1726070, 1730504 and 1729720
<b>Prep Batch :</b>	1726058, 1726069, 1730502 and 1729719
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32 and GL-MA-E-010 REV# 36
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A and EPA 245.2 1974
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

### **Preparation/Analytical Method Verification**

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

### **System Configuration**

The 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.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm.

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 350X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

### **Calibration Information**

#### **Instrument Calibration**

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

#### **CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 439936006 (CAWA-18-150366), 439936009 (CAWA-18-150418) and 439936010 (CAWA-18-150419)-ICP.

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

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

#### **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 MBs 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 samples were selected as the quality control (QC) samples for this SDG: 439940001 (CALA-18-150103)-ICP, ICP-MS, ICP-MS and CVAA and 439936001 (CAWA-18-148918)-CVAA.

**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**

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Analyte	Sample	Value
Potassium	1203938113 (CALA-18-150103SDILT)	15.7 *(0%-10%)

**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 samples in this SDG did not require dilutions.

**Preparation Information**

The samples in this SDG were 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: 2018-1240 GEL Work Order: 439936

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

- \* A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging 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: Jamie Johnson**

**Date: 10 JAN 2018**

**Title: Group Leader**

# Sample Data Summary

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 439936001**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-148918**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	01/08/18 13:21	010818W2-5	1729720

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1729720	1729719	EPA 245.1/245.2 Prep	20	mL	20	mL	01/05/18	AXS5

**\*Analytical Methods:**

AV      EPA 245.2 1974

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 439936004**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-148943**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	01/08/18 13:30	010818W2-5	1729720

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1729720	1729719	EPA 245.1/245.2 Prep	20	mL	20	mL	01/05/18	AXS5

**\*Analytical Methods:**

AV      EPA 245.2 1974

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 439936006**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150366**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	01/08/18 13:32	010818W2-5	1729720

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

SDG No: 2018-1240

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 439936006

BASIS: As Received

DATE COLLECTED 11-DEC-17

CLIENT ID: CAWA-18-150366

LEVEL: Low

DATE RECEIVED 13-DEC-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-39-3	Barium	10.9	ug/L		1	5	5	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-70-2	Calcium	10200	ug/L		50	200	200	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	01/08/18 16:16	010818-1	1726059
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	01/08/18 16:16	010818-1	1726059
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7439-95-4	Magnesium	3130	ug/L		110	300	300	1	P	HSC	01/08/18 16:16	010818-1	1726059
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	01/08/18 16:16	010818-1	1726059
7439-98-7	Molybdenum	0.694	ug/L		0.2	0.5	0.5	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-02-0	Nickel	1.34	ug/L	J	0.6	2	2	1	MS	SKJ	01/10/18 08:53	180109-4	1730504
7440-09-7	Potassium	741	ug/L		50	150	150	1	P	HSC	01/09/18 06:51	010918-2	1726059
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7631-86-9	Silica	55600	ug/L		53	213	213	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-23-5	Sodium	7980	ug/L		100	300	300	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-24-6	Strontium	49.7	ug/L		1	5	5	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-61-1	Uranium	0.451	ug/L		0.067	0.2	0.2	1	MS	BAJ	01/08/18 20:48	180108-3	1726070
7440-62-2	Vanadium	1.62	ug/L	J	1	5	5	1	P	HSC	01/08/18 16:16	010818-1	1726059
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	01/08/18 16:16	010818-1	1726059

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 439936006**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150366**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	38.4	mg/L		0.453	1.24	1.24	1		NOR1	01/09/18 13:14		1730402

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1726059	1726058	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1726070	1726069	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1729720	1729719	EPA 245.1/245.2 Prep	20	mL	20	mL	01/05/18	AXS5
1730504	1730502	SW846 3005A	50	mL	50	mL	01/09/18	JXM8

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974



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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 439936009**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150418**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	01/08/18 13:33	010818W2-5	1729720

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

SDG No: 2018-1240

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 439936009

BASIS: As Received

DATE COLLECTED 11-DEC-17

CLIENT ID: CAWA-18-150418

LEVEL: Low

DATE RECEIVED 13-DEC-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-39-3	Barium	10.8	ug/L		1	5	5	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-70-2	Calcium	10400	ug/L		50	200	200	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	01/08/18 16:19	010818-1	1726059
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	01/08/18 16:19	010818-1	1726059
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7439-95-4	Magnesium	3190	ug/L		110	300	300	1	P	HSC	01/08/18 16:19	010818-1	1726059
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	01/08/18 16:19	010818-1	1726059
7439-98-7	Molybdenum	0.640	ug/L		0.2	0.5	0.5	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-02-0	Nickel	1.44	ug/L	J	0.6	2	2	1	MS	SKJ	01/10/18 08:55	180109-4	1730504
7440-09-7	Potassium	751	ug/L		50	150	150	1	P	HSC	01/09/18 06:54	010918-2	1726059
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7631-86-9	Silica	56800	ug/L		53	213	213	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-23-5	Sodium	8140	ug/L		100	300	300	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-24-6	Strontium	50.3	ug/L		1	5	5	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-61-1	Uranium	0.456	ug/L		0.067	0.2	0.2	1	MS	BAJ	01/08/18 20:51	180108-3	1726070
7440-62-2	Vanadium	1.84	ug/L	J	1	5	5	1	P	HSC	01/08/18 16:19	010818-1	1726059
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	01/08/18 16:19	010818-1	1726059

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 439936009**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150418**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	39.1	mg/L		0.453	1.24	1.24	1		NOR1	01/09/18 13:14		1730402

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1726059	1726058	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1726070	1726069	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1729720	1729719	EPA 245.1/245.2 Prep	20	mL	20	mL	01/05/18	AXS5
1730504	1730502	SW846 3005A	50	mL	50	mL	01/09/18	JXM8

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 439936010**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150419**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	01/08/18 13:38	010818W2-5	1729720

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

SDG No: 2018-1240

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 439936010

BASIS: As Received

DATE COLLECTED 11-DEC-17

CLIENT ID: CAWA-18-150419

LEVEL: Low

DATE RECEIVED 13-DEC-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-39-3	Barium	10.7	ug/L		1	5	5	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-70-2	Calcium	10400	ug/L		50	200	200	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	01/08/18 16:22	010818-1	1726059
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	01/08/18 16:22	010818-1	1726059
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7439-95-4	Magnesium	3200	ug/L		110	300	300	1	P	HSC	01/08/18 16:22	010818-1	1726059
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	01/08/18 16:22	010818-1	1726059
7439-98-7	Molybdenum	0.579	ug/L		0.2	0.5	0.5	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-02-0	Nickel	1.56	ug/L	J	0.6	2	2	1	MS	SKJ	01/10/18 08:56	180109-4	1730504
7440-09-7	Potassium	708	ug/L		50	150	150	1	P	HSC	01/09/18 06:57	010918-2	1726059
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7631-86-9	Silica	57100	ug/L		53	213	213	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-23-5	Sodium	8070	ug/L		100	300	300	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-24-6	Strontium	50.5	ug/L		1	5	5	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-61-1	Uranium	0.427	ug/L		0.067	0.2	0.2	1	MS	BAJ	01/08/18 20:55	180108-3	1726070
7440-62-2	Vanadium	1.45	ug/L	J	1	5	5	1	P	HSC	01/08/18 16:22	010818-1	1726059
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	01/08/18 16:22	010818-1	1726059

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

**SDG No:** 2018-1240**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 439936010**BASIS:** As Received**DATE COLLECTED** 11-DEC-17**CLIENT ID:** CAWA-18-150419**LEVEL:** Low**DATE RECEIVED** 13-DEC-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	39.1	mg/L		0.453	1.24	1.24	1		NOR1	01/09/18 13:14		1730402

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1726059	1726058	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1726070	1726069	SW846 3005A	50	mL	50	mL	12/13/17	JXM8
1729720	1729719	EPA 245.1/245.2 Prep	20	mL	20	mL	01/05/18	AXS5
1730504	1730502	SW846 3005A	50	mL	50	mL	01/09/18	JXM8

**\*Analytical Methods:****P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.2 1974

# **Quality Control Summary**

**METALS**  
**-3b-**  
**PREPARATION BLANK SUMMARY**

SDG NO. 2018-1240

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>
1203938109	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	255	ug/L	+/-300	J	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203938138	Antimony	1.59	ug/L	+/-3	J	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203947440	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2
1203949447	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2

## \*Analytical Methods:

P SW846 3005A/6010C  
MS SW846 3005A/6020A  
AV EPA 245.1/245.2



## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2018-1240 Client ID: CALA-18-150103S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 439940001 Spike ID: 1203938112

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4950		68	U	5000	98.7		P
Barium	ug/L	75-125	554		67.7		500	97.2		P
Beryllium	ug/L	75-125	491		1	U	500	98.3		P
Boron	ug/L	75-125	549		47.5	J	500	100		P
Calcium	ug/L		29600		24800		5000	96.3	N/A	P
Cobalt	ug/L	75-125	504		1	U	500	101		P
Copper	ug/L	75-125	497		3	U	500	99.2		P
Iron	ug/L	75-125	4940		30	U	5000	98.7		P
Magnesium	ug/L	75-125	11300		6120		5000	104		P
Manganese	ug/L	75-125	485		2	U	500	97		P
Potassium	ug/L	75-125	8500		3550		5000	99.1		P
Silica	ug/L		84600		73000		10700	109	N/A	P
Sodium	ug/L	75-125	21900		17400		5000	88.6		P
Strontium	ug/L	75-125	612		132		500	96		P
Tin	ug/L	75-125	498		2.5	U	500	99.7		P
Vanadium	ug/L	75-125	497		10.8		500	97.3		P
Zinc	ug/L	75-125	487		3.3	U	500	97.5		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2018-1240 Client ID: CALA-18-150103S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 439940001 Spike ID: 1203938141

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	45.5		1	U	50	90		MS
Arsenic	ug/L	75-125	51.1		2.25	J	50	97.7		MS
Cadmium	ug/L	75-125	47.6		0.3	U	50	95.1		MS
Chromium	ug/L	75-125	57.1		4.08	J	50	106		MS
Lead	ug/L	75-125	47.6		0.5	U	50	95		MS
Molybdenum	ug/L	75-125	50.4		1.22		50	98.3		MS
Selenium	ug/L	75-125	48.6		2	U	50	96.6		MS
Silver	ug/L	75-125	47.7		0.3	U	50	95.3		MS
Thallium	ug/L	75-125	45		0.6	U	50	89.9		MS
Uranium	ug/L	75-125	47.8		1.59		50	92.5		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2018-1240 **Client ID:** CAWA-18-148918S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 439936001 **Spike ID:** 1203947445

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.05		0.067	U	2	103		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2018-1240 **Client ID:** CALA-18-150103S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 439940001 **Spike ID:** 1203949450

<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>
Nickel	ug/L	75-125	51.4		0.663	J	50	102		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

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

SDG No.: 2018-1240

Lab Code: GEL

Contract: ESHL00114

Client ID: CALA-18-150103D

Matrix: WATER

Level: Low

Sample ID: 439940001

Duplicate ID: 1203938111

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-20%	67.7		68.1		.567		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	47.5 J		47 J		1.17		P
Calcium	ug/L	+/-20%	24800		24500		1.37		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	6120		6140		.4		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	3550		3560		.492		P
Silica	ug/L	+/-20%	73000		74400		1.89		P
Sodium	ug/L	+/-20%	17400		17200		1.24		P
Strontium	ug/L	+/-20%	132		130		1.02		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	10.8		10.9		.672		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2018-1240

Lab Code: GEL

Contract: ESHL00114

Client ID: CALA-18-150103D

Matrix: WATER

Level: Low

Sample ID: 439940001

Duplicate ID: 1203938140

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.25 J		2.18 J		3.16		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	4.08 J		4.12 J		1.1		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.22		1.12		8.87		MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/-20%	1.59		1.58		.316		MS

\*Analytical Methods:

MS SW846 3005A/6020A

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

**SDG No.:** 2018-1240**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-18-148918D**Matrix:** WATER**Level:** Low**Sample ID:** 439936001**Duplicate ID:** 1203947443**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

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

**SDG No.:** 2018-1240**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CALA-18-150103D**Matrix:** WATER**Level:** Low**Sample ID:** 439940001**Duplicate ID:** 1203949449**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Nickel	ug/L	+/-2	0.663 J		0.672 J		1.35		MS

\*Analytical Methods:

MS SW846 3005A/6020A



## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2018-1240

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>
1203938110								
	Manganese	ug/L	500	481		96.2	80-120	P
	Potassium	ug/L	5000	4610		92.2	80-120	P
	Silica	ug/L	10700	9780		91.3	80-120	P
	Sodium	ug/L	5000	4610		92.3	80-120	P
	Strontium	ug/L	500	466		93.1	80-120	P
	Tin	ug/L	500	482		96.3	80-120	P
	Vanadium	ug/L	500	469		93.8	80-120	P
	Zinc	ug/L	500	477		95.3	80-120	P
	Aluminum	ug/L	5000	4880		97.7	80-120	P
	Barium	ug/L	500	462		92.4	80-120	P
	Beryllium	ug/L	500	473		94.6	80-120	P
	Boron	ug/L	500	462		92.3	80-120	P
	Calcium	ug/L	5000	4940		98.8	80-120	P
	Cobalt	ug/L	500	499		99.8	80-120	P
	Copper	ug/L	500	473		94.7	80-120	P
	Iron	ug/L	5000	4860		97.2	80-120	P
	Magnesium	ug/L	5000	5080		102	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2018-1240

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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>
1203938139								
	Antimony	ug/L	50	47.7		95.4	80-120	MS
	Arsenic	ug/L	50	52.2		104	80-120	MS
	Cadmium	ug/L	50	49.6		99.3	80-120	MS
	Chromium	ug/L	50	49.8		99.5	80-120	MS
	Lead	ug/L	50	48.9		97.9	80-120	MS
	Molybdenum	ug/L	50	49.2		98.4	80-120	MS
	Selenium	ug/L	50	52.2		104	80-120	MS
	Silver	ug/L	50	51		102	80-120	MS
	Thallium	ug/L	50	46		92	80-120	MS
	Uranium	ug/L	50	46.5		93	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2018-1240

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203947441	Mercury	ug/L	2	2.06		103	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2018-1240

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

Solid LCS Source:

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<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>
1203949448	Nickel	ug/L	50	57.4		115	80-120	MS

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## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2018-1240 **Client ID:** CALA-18-150103L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 439940001 **Serial Dilution ID:** 1203938113

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	67.7		69.8		2.99		10	P
Beryllium	1	U	5	U				P
Boron	47.5	J	75	U	10.074			P
Calcium	24800		25500		2.959		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	6120		6240		1.983		10	P
Manganese	2	U	10	U				P
Potassium	3550		2990		15.713	E	10	P
Silica	73000		75200		3.011		10	P
Sodium	17400		18700		7.117		10	P
Strontium	132		135		2.51		10	P
Tin	2.5	U	12.5	U				P
Vanadium	10.8		10.8	J	.249			P
Zinc	3.3	U	24.7	J				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2018-1240 **Client ID:** CALA-18-150103L

**Contract:** ESHL00114

**Matrix:** LIQUID **Level:** Low

**Sample ID:** 439940001 **Serial Dilution ID:** 1203938142

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2.25	J	10	U	8.1			MS
Cadmium	.3	U	1.5	U				MS
Chromium	4.08	J	15	U	1.054			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.22		1.26	J	2.533			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	1.59		1.57		1.386			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2018-1240 **Client ID:** CAWA-18-148918L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 439936001 **Serial Dilution ID:** 1203947447

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

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2018-1240 **Client ID:** CALA-18-150103L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 439940001 **Serial Dilution ID:** 1203949451

<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>
Nickel	.663	J	9.33	J	1306.486			MS

## \*Analytical Methods:

MS SW846 3005A/6020A



# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2018-1240  
Work Order #: 439936**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1725569

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW-846:9060:

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
439936008	CAWA-18-150367
1203939348	Method Blank (MB)
1203939349	Laboratory Control Sample (LCS)
1203939350	439737004(CAWA-18-148944) Sample Duplicate (DUP)
1203939352	439737004(CAWA-18-148944) 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-093 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 Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 439737004 (CAWA-18-148944) 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1726228	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1726227	<b>Method:</b>	EPA 335.4

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 335.4 1993:

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938583	Method Blank (MB)
1203938584	Laboratory Control Sample (LCS)
1203938586	439936001(CAWA-18-148918) Sample Duplicate (DUP)
1203938589	439936001(CAWA-18-148918) 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-095 REV# 21.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **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.

### **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 439936001 (CAWA-18-148918) 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1727180

**Method:** WSP-ANIONS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203940891	Method Blank (MB)
1203940892	Laboratory Control Sample (LCS)
1203940893	439940001(CALA-18-150103) Sample Duplicate (DUP)
1203940894	439940001(CALA-18-150103) 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-3000 Ion Chromatograph.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Continuing Calibration Blanks**

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

#### **Calibration Verification Information (CCV)**

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

#### **Y Intercept Rule**



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

#### **Quality Control (QC) Information**

##### **Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

##### **Laboratory Control Sample 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 439940001 (CALA-18-150103) 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 1203940893 (CALA-18-150103DUP), 439936006 (CAWA-18-150366), 439936009 (CAWA-18-150418) and 439936010 (CAWA-18-150419) 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:** Ammonia Nitrogen  
**Analytical Batch:** 1725911 **Method:** NH3  
**Prep Batch :** 1725910 **Method:** EPA 350.1 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203937731	Method Blank (MB)
1203937732	Laboratory Control Sample (LCS)
1203938294	439940001(CALA-18-150103) Sample Duplicate (DUP)
1203938296	439940001(CALA-18-150103) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 10.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 439940001 (CALA-18-150103) was selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Nitrogen, Ammonia	1203938296 (CALA-18-150103MS)	116* (90%-110%)

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Samples 1203937731 (MB), 1203937732 (LCS), 439936006 (CAWA-18-150366), 439936009 (CAWA-18-150418) and 439936010 (CAWA-18-150419) were re-analyzed due to CCV failure. The reanalysis data with passing

instrument QC was reported.

### **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**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1726143	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1726142	<b>Method:</b>	EPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
439936008	CAWA-18-150367
1203938297	Method Blank (MB)
1203938298	Laboratory Control Sample (LCS)
1203938299	439936004(CAWA-18-148943) Sample Duplicate (DUP)
1203938300	439936001(CAWA-18-148918) Sample Duplicate (DUP)
1203938301	439936004(CAWA-18-148943) Matrix Spike (MS)
1203938302	439936001(CAWA-18-148918) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 439936001 (CAWA-18-148918) and 439936004 (CAWA-18-148943) were selected for QC analysis.

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

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203938301 (CAWA-18-148943MS)	114* (90%-110%)
	1203938302 (CAWA-18-148918MS)	129* (90%-110%)

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1726147

**Method:** NO3NO2

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203938309	Method Blank (MB)
1203938310	Laboratory Control Sample (LCS)
1203938312	439936006(CAWA-18-150366) Sample Duplicate (DUP)
1203938315	439936006(CAWA-18-150366) Post Spike (PS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 10.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Calibration Verification Information**

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

#### **Continuing Calibration Blanks**

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

#### **Calibration Verification Information (CCV)**

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

acceptance limits.

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 439936006 (CAWA-18-150366) 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1725512	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1725511	<b>Method:</b>	EPA 365.4 Prep

### **Sample Analysis**

The following samples were analyzed using the analytical protocol as established in EPA 365.4 1974:

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203936758	Method Blank (MB)
1203936759	Laboratory Control Sample (LCS)
1203936760	439737004(CAWA-18-148944) Sample Duplicate (DUP)
1203936761	439737004(CAWA-18-148944) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-103 REV# 11.

### **Preparation/Analytical Method Verification**

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

### **Calibration Information**

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

### **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 439737004 (CAWA-18-148944) 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information****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:** 1727170

**Method:** TDS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203940870	Method Blank (MB)
1203940871	Laboratory Control Sample (LCS)
1203940872	439936010(CAWA-18-150419) 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 439936010 (CAWA-18-150419) 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	1203940872 (CAWA-18-150419DUP)	9.52* (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:** 1728640

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203944648	Laboratory Control Sample (LCS)
1203944649	439936006(CAWA-18-150366) 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# 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 Titration and Ion analysis was performed on a Thermo Scientific Orion Star A212 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**

Sample 439936006 (CAWA-18-150366) 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**

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:** 1727518 **Method:** PH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203941751	Laboratory Control Sample (LCS)
1203941752	439936006(CAWA-18-150366) Sample Duplicate (DUP)
1203941753	439936009(CAWA-18-150418) 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# 23.

### **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**

Samples 439936006 (CAWA-18-150366) and 439936009 (CAWA-18-150418) 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**

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

Sample	Analyte	Value
1203941752 (CAWA-18-150366DUP)	pH	Received 13-DEC-17, out of holding 11-DEC-17
1203941753 (CAWA-18-150418DUP)	pH	Received 13-DEC-17, out of holding 11-DEC-17
439936006 (CAWA-18-150366)	pH	Received 13-DEC-17, out of holding 11-DEC-17
439936009 (CAWA-18-150418)	pH	Received 13-DEC-17, out of holding 11-DEC-17
439936010 (CAWA-18-150419)	pH	Received 13-DEC-17, out of holding 11-DEC-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:** 1727515      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
439936006	CAWA-18-150366
439936009	CAWA-18-150418
439936010	CAWA-18-150419
1203941744	Laboratory Control Sample (LCS)
1203941745	439936006(CAWA-18-150366) Sample Duplicate (DUP)
1203941746	439936009(CAWA-18-150418) Sample Duplicate (DUP)
1203941748	439936006(CAWA-18-150366) Matrix Spike (MS)
1203941749	439936009(CAWA-18-150418) 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**

Samples 439936006 (CAWA-18-150366) and 439936009 (CAWA-18-150418) were selected for QC analysis.

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

The MS/PS recoveries for this sample set were 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.

## **GEL LABORATORIES LLC**

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### **Qualifier Definition Report for**

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

Client SDG: 2018-1240 GEL Work Order: 439936


#### **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:** Aubrey Kingsbury

**Date:** 09 JAN 2018

**Title:** Analyst I

# **Sample Data Summary**



# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-148918  
Sample ID: 439936001  
Matrix: W  
Collect Date: 11-DEC-17 10:31  
Receive Date: 13-DEC-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.439	0.330	1.00	mg/L		1	TSM	12/16/17	0112	1725569	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	12/14/17	0753	1726228	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0535	0.033	0.100	mg/L	1.00	1	KLP1	12/20/17	1539	1726143	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	12/14/17	0658	1726227
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	12/20/17	0930	1726142

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA 335.4 1993	
3	EPA:351.2	

### 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

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1240

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-18-148943

Project: ESHL00114

Sample ID: 439936004

Client ID: ARSL004

Matrix: W

Collect Date: 11-DEC-17 10:31

Receive Date: 13-DEC-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.447	0.330	1.00	mg/L		1	TSM	12/16/17	0210	1725569	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	12/14/17	0756	1726228	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	12/20/17	1541	1726143	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	12/14/17	0658	1726227
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	12/20/17	0930	1726142

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA 335.4 1993	
3	EPA:351.2	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150366  
Sample ID: 439936006  
Matrix: W  
Collect Date: 11-DEC-17 10:56  
Receive Date: 13-DEC-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	U	ND	0.067	0.200	mg/L		1	JXH5	12/18/17	1543	1727180	1
Chloride		1.43	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		2.74	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.071	0.017	0.050	mg/L	1.00	1	KLP1	12/14/17	1233	1725911	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.619	0.017	0.050	mg/L		1	AXH3	12/15/17	0651	1726147	3
PO4 "As Received"												
Phosphorus, Total as P		0.0588	0.020	0.050	mg/L	1.00	1	KLP1	12/15/17	1430	1725512	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		103	3.40	14.3	mg/L			KLP1	12/18/17	1458	1727170	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		54.4	1.45	4.00	mg/L			RXB5	12/23/17	1033	1727515	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		116	1.00	1.00	umhos/cm		1	VH1	01/06/18	1012	1728640	7
PH "As Received"												
pH at Temp 10.5C	H	7.65	0.010	0.100	SU		1	RXB5	12/23/17	1030	1727518	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/14/17	0759	1725910
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/14/17	1700	1725511

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150366  
Sample ID: 439936006

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description					Analyst Comments						
1	EPA:300.0											
2	EPA:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	EPA 150.1 1982											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150367  
Sample ID: 439936008  
Matrix: W  
Collect Date: 11-DEC-17 10:56  
Receive Date: 13-DEC-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.442	0.330	1.00	mg/L		1	TSM	12/16/17	0249	1725569	1
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	12/20/17	1543	1726143	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	12/20/17	0930	1726142

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA:351.2	

### 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

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150418  
Sample ID: 439936009  
Matrix: W  
Collect Date: 11-DEC-17 10:31  
Receive Date: 13-DEC-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	U	ND	0.067	0.200	mg/L		1	JXH5	12/18/17	1614	1727180	1
Chloride		1.38	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		2.72	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0313	0.017	0.050	mg/L	1.00	1	KLP1	12/14/17	1234	1725911	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.631	0.017	0.050	mg/L		1	AXH3	12/15/17	0655	1726147	3
PO4 "As Received"												
Phosphorus, Total as P		0.076	0.020	0.050	mg/L	1.00	1	KLP1	12/15/17	1430	1725512	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		110	3.40	14.3	mg/L			KLP1	12/18/17	1458	1727170	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		56.4	1.45	4.00	mg/L			RXB5	12/23/17	1041	1727515	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		115	1.00	1.00	umhos/cm		1	VH1	01/06/18	1012	1728640	7
PH "As Received"												
pH at Temp 10.6C	H	7.68	0.010	0.100	SU		1	RXB5	12/23/17	1039	1727518	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/14/17	0759	1725910
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/14/17	1700	1725511

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150418  
Sample ID: 439936009

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description					Analyst Comments						
1	EPA:300.0											
2	EPA:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	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

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150419  
Sample ID: 439936010  
Matrix: W  
Collect Date: 11-DEC-17 10:31  
Receive Date: 13-DEC-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	U	ND	0.067	0.200	mg/L		1	JXH5	12/18/17	1645	1727180	1
Chloride		1.39	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		2.70	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0284	0.017	0.050	mg/L	1.00	1	KLP1	12/14/17	1235	1725911	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.634	0.017	0.050	mg/L		1	AXH3	12/15/17	0656	1726147	3
PO4 "As Received"												
Phosphorus, Total as P		0.107	0.020	0.050	mg/L	1.00	1	KLP1	12/15/17	1431	1725512	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		100	3.40	14.3	mg/L			KLP1	12/18/17	1458	1727170	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		54.1	1.45	4.00	mg/L			RXB5	12/23/17	1048	1727515	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		116	1.00	1.00	umhos/cm		1	VH1	01/06/18	1012	1728640	7
PH "As Received"												
pH at Temp 12.2C	H	7.71	0.010	0.100	SU		1	RXB5	12/23/17	1047	1727518	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/14/17	0759	1725910
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/14/17	1700	1725511



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## Certificate of Analysis

Report Date: January 9, 2018

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: 2018-1240

Client Sample ID: CAWA-18-150419  
Sample ID: 439936010

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description					Analyst Comments						
1	EPA:300.0											
2	EPA:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	EPA 150.1 1982											

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: January 9, 2018

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

Contact: Ms. Nita Patel

Workorder: 439936

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1725569										
QC1203939350	439737004	DUP									
Total Organic Carbon Average		U	ND	U	ND	mg/L	N/A		TSM	12/15/17	21:56
QC1203939349	LCS										
Total Organic Carbon Average	10.0				10.4	mg/L	104	(80%-120%)		12/15/17	20:28
QC1203939348	MB										
Total Organic Carbon Average			U	ND	mg/L					12/15/17	20:18
QC1203939352	439737004	PS									
Total Organic Carbon Average	10.0	U	ND		10.5	mg/L	105	(75%-125%)		12/15/17	22:36
<b>Flow Injection Analysis</b>											
Batch	1726228										
QC1203938586	439936001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	12/14/17	07:54
QC1203938584	LCS										
Cyanide, Total	50.0				49.1	ug/L	98.2	(90%-110%)		12/14/17	07:48
QC1203938583	MB										
Cyanide, Total			U	ND	ug/L					12/14/17	07:47
QC1203938589	439936001	MS									
Cyanide, Total	100	U	ND		103	ug/L	103	(90%-110%)		12/14/17	07:55
<b>Ion Chromatography</b>											
Batch	1727180										
QC1203940893	439940001	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		JXH5	12/18/17	17:47

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1727180										
Chloride		6.07		5.95	mg/L	1.94		(0%-20%)	JXH5	12/18/17	17:47
Fluoride		0.147		0.172	mg/L	15.6	^	(+/-0.100)			
Sulfate		5.29		5.28	mg/L	0.185		(0%-20%)			
QC1203940892 LCS											
Bromide	1.25			1.20	mg/L		96.1	(80%-120%)		12/18/17	15:13
Chloride	5.00			4.56	mg/L		91.2	(80%-120%)			
Fluoride	2.50			2.38	mg/L		95.3	(80%-120%)			
Sulfate	10.0			9.86	mg/L		98.6	(80%-120%)			
QC1203940891 MB											
Bromide			U	ND	mg/L					12/18/17	14:42
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203940894 439940001 PS											
Bromide	1.25	U	ND	1.28	mg/L		97.3	(75%-125%)		12/18/17	18:18
Chloride	5.00		6.07	11.7	mg/L		112	(75%-125%)			
Fluoride	2.50		0.147	2.70	mg/L		102	(75%-125%)			
Sulfate	10.0		5.29	15.1	mg/L		98.3	(75%-125%)			

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1725512										
QC1203936760	439737004	DUP									
Phosphorus, Total as P		0.0666		0.0605	mg/L	9.6	^	(+/-0.050)	KLP1	12/15/17	14:17
QC1203936759	LCS										
Phosphorus, Total as P	1.00			1.00	mg/L			100	(80%-124%)	12/15/17	14:15
QC1203936758	MB										
Phosphorus, Total as P			J	0.0201	mg/L					12/15/17	14:14
QC1203936761	439737004	MS									
Phosphorus, Total as P	1.00	0.0666		1.09	mg/L			102	(63%-139%)	12/15/17	14:18
Batch	1725911										
QC1203938294	439940001	DUP									
Nitrogen, Ammonia		J	0.0355	J	0.0371	mg/L	4.41	^	(+/-0.050)	KLP1	12/14/17 12:40
QC1203937732	LCS										
Nitrogen, Ammonia	1.00			1.08	mg/L			108	(90%-110%)	12/14/17	12:29
QC1203937731	MB										
Nitrogen, Ammonia			J	0.0403	mg/L					12/14/17	12:28
QC1203938296	439940001	MS									
Nitrogen, Ammonia	1.00	J	0.0355	1.20	mg/L			116*	(90%-110%)	12/14/17	12:41
Batch	1726143										
QC1203938299	439936004	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			KLP1	12/20/17 15:42
QC1203938300	439936001	DUP									
Nitrogen, Total Kjeldahl		J	0.0535	U	ND	mg/L	200	^		12/20/17	15:39
QC1203938298	LCS										
Nitrogen, Total Kjeldahl	1.00			1.10	mg/L			110	(90%-110%)	12/20/17	15:38

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1726143										
QC1203938297	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L				KLP1	12/20/17	15:37
QC1203938301	439936004	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.14	mg/L		114*	(90%-110%)		12/20/17	15:43
QC1203938302	439936001	MS									
Nitrogen, Total Kjeldahl	1.00	J	0.0535	1.34	mg/L		129*	(90%-110%)		12/20/17	15:40
Batch	1726147										
QC1203938312	439936006	DUP									
Nitrogen, Nitrate/Nitrite			0.619	0.628	mg/L	1.44		(0%-20%)	AXH3	12/15/17	06:52
QC1203938310	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.03	mg/L		103	(90%-110%)		12/15/17	06:46
QC1203938309	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					12/15/17	06:45
QC1203938315	439936006	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.619	1.63	mg/L		101	(90%-110%)		12/15/17	06:53
<b>Solids Analysis</b>											
Batch	1727170										
QC1203940872	439936010	DUP									
Total Dissolved Solids			100	110	mg/L	9.52*		(0%-5%)	KLP1	12/18/17	14:58
QC1203940871	LCS										
Total Dissolved Solids	300			291	mg/L		97.1	(95%-105%)		12/18/17	14:58
QC1203940870	MB										
Total Dissolved Solids			U	ND	mg/L					12/18/17	14:58

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1727515										
QC1203941745 439936006 DUP											
Alkalinity, Total as CaCO3		54.4		52.1	mg/L	4.16		(0%-20%)	RXB5	12/23/17	10:35
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203941746 439936009 DUP											
Alkalinity, Total as CaCO3		56.4		52.3	mg/L	7.41		(0%-20%)		12/23/17	10:43
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203941744 LCS											
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		12/23/17	10:27
QC1203941748 439936006 MS											
Alkalinity, Total as CaCO3	100	54.4		159	mg/L		105	(80%-120%)		12/23/17	10:36
QC1203941749 439936009 MS											
Alkalinity, Total as CaCO3	100	56.4		159	mg/L		102	(80%-120%)		12/23/17	10:44
Batch	1727518										
QC1203941752 439936006 DUP											
pH	H	7.65	H	7.66	SU	0.131		(0%-5%)	RXB5	12/23/17	10:34
QC1203941753 439936009 DUP											
pH	H	7.68	H	7.71	SU	0.39		(0%-5%)		12/23/17	10:41
QC1203941751 LCS											
pH	7.00			6.99	SU		99.9	(99%-101%)		12/23/17	10:25
Batch	1728640										
QC1203944649 439936006 DUP											
Conductivity		116		116	umhos/cm	0.086		(0%-10%)	VH1	01/06/18	10:12

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1728640										
QC1203944648	LCS										
Conductivity	1410			1400	umhos/cm		99.3	(95%-105%)	VH1	01/06/18	10:11

### 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
- 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.



# **Radiological Analysis**

# Case Narrative

**Radiochemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2018-1240  
Work Order #: 439936**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1726037

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938053	Method Blank (MB)
1203938055	Laboratory Control Sample (LCS)
1203938054	439936001(CAWA-18-148918) 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-RAD-A-011 REV# 26.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in December 2017.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

Aliquots for samples 1203938053 (MB) and 1203938055 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

**Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

**CSU**

The blank result is less than 1.65 times the CSU.

**Blank Decision Level**

The blank result is less than the decision level.

**Tracer/Carrier Yield**

All yields met the required acceptance limits.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439936001 (CAWA-18-148918). The QC was from ARSL work order 439936.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

**RDL Met**

The method RDL has been met.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Negative > 3 sigma TPU**

Samples results are not more negative than three sigma TPU.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Manual Integration**

No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** IsoU

Analytical Method: HASL-300:ISOU

Analytical Batch Number: 1726039

Sample ID	Client ID
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938059	Method Blank (MB)
1203938061	Laboratory Control Sample (LCS)
1203938060	439936001(CAWA-18-148918) 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-RAD-A-011 REV# 26.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in December 2017.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

Aliquots for samples 1203938059 (MB) and 1203938061 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

##### **Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

##### **CSU**

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203938059 (MB)	Uranium-233/234, Uranium-235/236 and Uranium-238	Blank result > 1.65 CSU

**Blank Decision Level**

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203938059 (MB)	Uranium-233/234, Uranium-235/236 and Uranium-238	Blank result > DL

**Tracer/Carrier Yield**

All yields met the required acceptance limits.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439936001 (CAWA-18-148918). The QC was from ARSL work order 439936.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

**RDL Met**

The method RDL has been met.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Negative > 3 sigma TPU**

Samples results are not more negative than three sigma TPU.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

**Miscellaneous Information:****Manual Integration**

No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier Information**

Manual qualifiers were not required.

## **Method/Analysis Information**

**Product:** ISOPU  
**Analytical Method:** HASL-300:ISOPU  
**Analytical Batch Number:** 1729763

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203947537	Method Blank (MB)
1203947539	Laboratory Control Sample (LCS)
1203947538	439936001(CAWA-18-148918) 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-RAD-A-011 REV# 26.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in December 2017.

#### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

### **Quality Control (QC) Information:**

#### **Blank Information**

Aliquots for samples 1203947537 (MB) and 1203947539 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

#### **Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

#### **CSU**

The blank result is less than 1.65 times the CSU.

#### **Blank Decision Level**

The blank result is less than the decision level.

#### **Tracer/Carrier Yield**

All yields met the required acceptance limits.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439936001 (CAWA-18-148918). The QC was from ARSL work order 439936.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

**RDL Met**

The method RDL has been met.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Negative > 3 sigma TPU**

Samples results are not more negative than three sigma TPU.

**Sample Re-prep/Re-analysis**

Samples were re-prepped due to low carrier/tracer yield. The re-analysis is being reported.

**Recounts**

None of the samples in this sample set were recounted.

**Miscellaneous Information:**

**Manual Integration**

No manual integrations were performed on data in this batch.

**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>Gammascpec</b>
Analytical Method:	EPA:901.1
Analytical Batch Number:	1726215



Sample ID	Client ID
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938545	Method Blank (MB)
1203938547	Laboratory Control Sample (LCS)
1203938546	439936001(CAWA-18-148918) 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-RAD-A-013 REV# 27.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2017, May 2017, October 2017 and September 2017.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

##### **CSU**

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203938545 (MB)	Sodium-22	Blank result > 1.65 CSU

##### **Blank Decision Level**

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203938545 (MB)	Potassium-40	Blank result > DL

##### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439936001 (CAWA-18-148918). The QC was from ARSL work order 439936.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

**RDL Met**

The method RDL has been met.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

**Additional Identified Radionuclides**

No additional radionuclides were added.

**Miscellaneous Information:****Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

Additional comments were not required for this sample set.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1726106

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938211	Method Blank (MB)
1203938214	Laboratory Control Sample (LCS)
1203938212	439739003(BDW01-18-150415) 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-RAD-A-004 REV# 19.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2016.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

Aliquots for samples 1203938211 (MB) and 1203938214 (LCS) were changed to 1.0 per client request.

**Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

**CSU**

The blank result is less than 1.65 times the CSU.

**Blank Decision Level**

The blank result is less than the decision level.

**Tracer/Carrier Yield**

All yields met the required acceptance limits.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439739003 (BDW01-18-150415). The QC was from ARSL work order 439739.

**Matrix Spike (MS) Recovery**

The MS spike recoveries met acceptance limits.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

**RDL Met**

The method RDL has been met.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Negative > 3 sigma TPU**

Samples results are not more negative than three sigma TPU.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Recounts**

Sample 1203938212 (BDW01-18-150415DUP) was recounted due to results more negative than the three sigma TPU. The second count is reported. Sample 439936004 (CAWA-18-148943) was recounted due to a suspected false positive. The recount is reported.

**Miscellaneous Information:****Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

The matrix spike, 1203938213 (BDW01-18-150415MS), aliquot was reduced to conserve sample volume.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>WSP-GrossA/B</b>
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1726298

<b>Sample ID</b>	<b>Client ID</b>
439936001	CAWA-18-148918
439936004	CAWA-18-148943
1203938766	Method Blank (MB)
1203938770	Laboratory Control Sample (LCS)
1203938767	439739003(BDW01-18-150415) Sample Duplicate (DUP)
1203938768	439739003(BDW01-18-150415) Matrix Spike (MS)
1203938769	439739003(BDW01-18-150415) Matrix Spike Duplicate (MSD)

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

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2017.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

Aliquots for samples 1203938766 (MB) and 1203938770 (LCS) were changed to 1.0 per client request.

**Method Blank Criteria**

The Method Blank (MB) met acceptance criteria.

**CSU**

The blank result is less than 1.65 times the CSU.

**Blank Decision Level**

The blank result is less than the decision level.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Designated QC**

The following sample was used for QC: 439739003 (BDW01-18-150415). The QC was from ARSL work order 439739.

**Matrix Spike (MS) Recovery**

The MS spike recoveries met acceptance limits.

**Duplication Criteria between MS and MSD**

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

**Duplication Criteria between QC Sample and Duplicate Sample**

The QC Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1203938767 (BDW01-18-150415DUP)	ALPHA	RPD 34.5* (0.00%-20.00%) RER 0.587 (0-1)

**RDL Met**

The method RDL has been met.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Negative > 3 sigma TPU**

Samples results are not more negative than three sigma TPU.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Gross Alpha/Beta Preparation Information**

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

**Recounts**

None of the samples in this sample set were recounted.

**Miscellaneous Information:****Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

**Additional Comments**

The matrix spike and matrix spike duplicate, 1203938768 (BDW01-18-150415MS) and 1203938769 (BDW01-18-150415MSD), aliquots were reduced to conserve sample volume.

**Qualifier Information**

Manual qualifiers were not required.

**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: 2018-1240 GEL Work Order: 439936

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

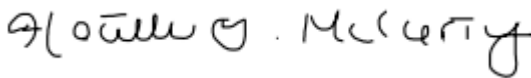
- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

#### **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:** Heather McCarty

**Date:** 09 JAN 2018

**Title:** Analyst II

# **Sample Data Summary**



# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: January 9, 2018

Client Sample ID: CAWA-18-148918  
Sample ID: 439936001  
Matrix: W  
Collect Date: 11-DEC-17  
Receive Date: 13-DEC-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00261	+/-0.00689	0.0426	0.0178	+/-0.00689	0.050	pCi/L			HAKB	12/20/17	1405	1726037	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00213	+/-0.00768	0.0429	0.0186	+/-0.00768	0.050	pCi/L			JXR5	01/08/18	1554	1729763	2
Plutonium-239/240	U	-0.00213	+/-0.00825	0.0462	0.0202	+/-0.00825	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.343	+/-0.032	0.131	0.0619	+/-0.0362	1.00	pCi/L			HAKB	12/20/17	1343	1726039	3
Uranium-235/236		0.0753	+/-0.0166	0.0614	0.0264	+/-0.017	1.00	pCi/L							
Uranium-238		0.211	+/-0.026	0.0648	0.029	+/-0.028	0.500	pCi/L							
<b>Rad Gamma Spec Analysis</b>															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-0.0344	+/-1.36	4.85	2.18	+/-1.36	8.00	pCi/L			BSW1	12/14/17	0847	1726215	4
Cobalt-60	U	1.79	+/-1.12	5.07	2.17	+/-1.20	8.00	pCi/L							
Neptunium-237	U	-2.31	+/-2.36	8.30	3.82	+/-2.43		pCi/L							
Potassium-40	U	1.40	+/-18.2	68.8	30.7	+/-18.2		pCi/L							
Sodium-22	U	0.247	+/-1.33	5.15	2.22	+/-1.33		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.247	+/-0.110	0.487	0.214	+/-0.110	0.500	pCi/L			LXB3	12/19/17	1551	1726106	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	1.23	+/-0.385	1.24	0.599	+/-0.399	3.00	pCi/L			AXH4	12/18/17	1922	1726298	6
Alpha	U	1.61	+/-0.885	2.81	1.08	+/-0.896	3.00	pCi/L			AXH4	12/19/17	1100	1726298	7

### The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1726037	73	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1729763	87.7	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1726039	76.9	(50%-105%)

# GEL LABORATORIES LLC

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## Certificate of Analysis

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 Sample ID: CAWA-18-148918

Sample ID: 439936001

Report Date: January 9, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Strontium Carrier		GFPC, Sr90, liquid "As Received"						1726106	95.5	(50%-105%)				

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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## Certificate of Analysis

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 Sample ID: CAWA-18-148943

Sample ID: 439936004

Matrix: W

Collect Date: 11-DEC-17

Receive Date: 13-DEC-17

Collector: Client

Report Date: January 9, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Alpha Spec Analysis</b>															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00222	+/-0.00968	0.0363	0.0151	+/-0.00968	0.050	pCi/L			HAKB	12/20/17	1405	1726037	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	-0.01	+/-0.00709	0.0505	0.0218	+/-0.00709	0.050	pCi/L			JXR5	01/08/18	1554	1729763	2
Plutonium-239/240	U	-0.00501	+/-0.00709	0.0543	0.0238	+/-0.00709	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.468	+/-0.0388	0.158	0.0746	+/-0.0456	1.00	pCi/L			HAKB	12/20/17	1344	1726039	3
Uranium-235/236	U	0.0567	+/-0.0156	0.0739	0.0318	+/-0.0159	1.00	pCi/L							
Uranium-238		0.297	+/-0.0314	0.0781	0.0349	+/-0.0348	0.500	pCi/L							
<b>Rad Gamma Spec Analysis</b>															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	1.74	+/-1.44	4.92	2.25	+/-1.49	8.00	pCi/L			BSW1	12/14/17	0848	1726215	4
Cobalt-60	U	2.99	+/-1.83	5.04	2.22	+/-1.96	8.00	pCi/L							
Neptunium-237	U	-2.1	+/-2.26	7.86	3.66	+/-2.31		pCi/L							
Potassium-40	U	-45	+/-16.8	51.2	22.6	+/-19.8		pCi/L							
Sodium-22	U	-0.498	+/-1.28	4.63	2.03	+/-1.29		pCi/L							
<b>Rad Gas Flow Proportional Counting</b>															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.247	+/-0.119	0.490	0.221	+/-0.119	0.500	pCi/L			LXB3	12/20/17	1113	1726106	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		1.79	+/-0.404	1.27	0.617	+/-0.431	3.00	pCi/L			AXH4	12/18/17	1922	1726298	6
Alpha	U	1.77	+/-0.854	2.53	0.907	+/-0.867	3.00	pCi/L			AXH4	12/19/17	1100	1726298	7

### The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1726037	75.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1729763	68.1	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1726039	72.3	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1726106	86.6	(50%-105%)

# GEL LABORATORIES LLC

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## Certificate of Analysis

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 Sample ID: CAWA-18-148943

Sample ID: 439936004

Report Date: January 9, 2018

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

### Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: January 9, 2018

Page 1 of 6

Client : Los Alamos National Laboratory  
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 439936

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1726037										
QC1203938054	439936001	DUP									
Americium-241	U	0.00261	U	0.0103	pCi/L	0.215		(0-1)	HAKB	12/20/17	14:05
	Uncert:	+/-0.00689		+/-0.0109							
	TPU:	+/-0.00689		+/-0.0109							
**Americium-243 Tracer	2.62	1.91		2.21	pCi/L		84.2	(50%-105%)			
	Uncert:	+/-0.0829		+/-0.0817							
	TPU:	+/-0.147		+/-0.145							
QC1203938055	LCS										
Americium-241	1.97			1.80	pCi/L		91.6	(80%-120%)	HAKB	12/20/17	14:05
	Uncert:			+/-0.0592							
	TPU:			+/-0.101							
**Americium-243 Tracer	2.10			1.79	pCi/L		85.1	(50%-105%)			
	Uncert:			+/-0.0629							
	TPU:			+/-0.113							
QC1203938053	MB										
Americium-241			U	-0.0316	pCi/L				HAKB	12/20/17	14:05
	Uncert:			+/-0.0182							
	TPU:			+/-0.0182							
**Americium-243 Tracer	2.10			1.61	pCi/L		77	(50%-105%)			
	Uncert:			+/-0.0671							
	TPU:			+/-0.118							
Batch	1726039										
QC1203938060	439936001	DUP									
Uranium-234		0.343		0.452	pCi/L	0.658		(0-1)	HAKB	12/20/17	13:44
	Uncert:	+/-0.032		+/-0.0404							
	TPU:	+/-0.0362		+/-0.0468							
Uranium-235/236		0.0753	U	0.0597	pCi/L	0.221		(0-1)			
	Uncert:	+/-0.0166		+/-0.0181							
	TPU:	+/-0.017		+/-0.0184							
Uranium-238		0.211		0.242	pCi/L	0.254		(0-1)			
	Uncert:	+/-0.026		+/-0.0301							
	TPU:	+/-0.028		+/-0.0326							
**Uranium-232 Tracer	2.62	2.01		1.68	pCi/L		64.1	(50%-105%)			
	Uncert:	+/-0.0839		+/-0.0958							
	TPU:	+/-0.153		+/-0.167							
QC1203938061	LCS										
Uranium-234				2.42	pCi/L				HAKB	12/20/17	13:44
	Uncert:			+/-0.0702							
	TPU:			+/-0.137							
Uranium-235/236				0.154	pCi/L						
	Uncert:			+/-0.0205							
	TPU:			+/-0.0218							

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1726039										
Uranium-238	2.70			2.64	pCi/L		97.7	(80%-120%)			
	Uncert:			+/-0.0729							
	TPU:			+/-0.148							
**Uranium-232 Tracer	2.09			1.80	pCi/L		86	(50%-105%)			
	Uncert:			+/-0.0654							
	TPU:			+/-0.121							
QC1203938059 MB											
Uranium-234			U	0.0553	pCi/L				HAKB	12/20/17	13:44
	Uncert:			+/-0.0121							
	TPU:			+/-0.0124							
Uranium-235/236			U	0.0253	pCi/L						
	Uncert:			+/-0.00948							
	TPU:			+/-0.00956							
Uranium-238			U	0.0266	pCi/L						
	Uncert:			+/-0.00983							
	TPU:			+/-0.00992							
**Uranium-232 Tracer	2.09			1.81	pCi/L		86.4	(50%-105%)			
	Uncert:			+/-0.0665							
	TPU:			+/-0.122							
Batch	1729763										
QC1203947538 439936001 DUP											
Plutonium-238		U	0.00213	U	-0.0137	pCi/L	0.558	(0-1)	JXR5	01/08/18	15:54
	Uncert:		+/-0.00768		+/-0.00648						
	TPU:		+/-0.00768		+/-0.00648						
Plutonium-239/240		U	-0.00213	U	-0.0156	pCi/L	0.449	(0-1)			
	Uncert:		+/-0.00825		+/-0.00676						
	TPU:		+/-0.00825		+/-0.00676						
**Plutonium-242 Tracer	2.45		2.16		2.38	pCi/L		97	(50%-105%)		
	Uncert:		+/-0.0738		+/-0.0696						
	TPU:		+/-0.125		+/-0.120						
QC1203947539 LCS											
Plutonium-238				U	0.00927	pCi/L		(80%-120%)	JXR5	01/08/18	15:54
	Uncert:				+/-0.00578						
	TPU:				+/-0.00579						
Plutonium-239/240	1.98				1.90	pCi/L		96.4	(80%-120%)		
	Uncert:				+/-0.0543						
	TPU:				+/-0.0931						
**Plutonium-242 Tracer	1.97				1.71	pCi/L		86.6	(50%-105%)		
	Uncert:				+/-0.0553						
	TPU:				+/-0.0958						
QC1203947537 MB											
Plutonium-238				U	0.00	pCi/L			JXR5	01/08/18	15:54
	Uncert:				+/-0.00501						
	TPU:				+/-0.00501						
Plutonium-239/240				U	-0.00159	pCi/L					
	Uncert:				+/-0.00572						

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 439936

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1729763										
**Plutonium-242 Tracer	TPU:			+/-0.00572							
	1.97			1.66	pCi/L		83.9	(50%-105%)			
	Uncert:			+/-0.0563							
	TPU:			+/-0.097							
Rad Gamma Spec											
Batch	1726215										
QC1203938546	439936001	DUP									
Cesium-137		U	-0.0344	U	1.65	pCi/L	0.26		(0-1)	BSW1	12/14/1711:14
		Uncert:	+/-1.36		+/-1.89						
		TPU:	+/-1.36		+/-1.89						
Cobalt-60		U	1.79	U	-0.0371	pCi/L	0.374		(0-1)		
		Uncert:	+/-1.12		+/-1.25						
		TPU:	+/-1.20		+/-1.25						
Neptunium-237		U	-2.31	U	-0.211	pCi/L	0.2		(0-1)		
		Uncert:	+/-2.36		+/-2.82						
		TPU:	+/-2.43		+/-2.82						
Potassium-40		U	1.40	U	-17.4	pCi/L	0.261		(0-1)		
		Uncert:	+/-18.2		+/-17.4						
		TPU:	+/-18.2		+/-17.8						
Sodium-22		U	0.247	U	0.756	pCi/L	0.0991		(0-1)		
		Uncert:	+/-1.33		+/-1.22						
		TPU:	+/-1.33		+/-1.24						
QC1203938547	LCS										
Americium-241		34300			36600	pCi/L		107	(80%-120%)	BSW1	12/14/1711:14
		Uncert:			+/-615						
		TPU:			+/-2080						
Cesium-137		13000			13200	pCi/L		102	(80%-120%)		
		Uncert:			+/-163						
		TPU:			+/-579						
Cobalt-60		11100			11500	pCi/L		104	(80%-120%)		
		Uncert:			+/-176						
		TPU:			+/-571						
Neptunium-237				U	-118	pCi/L					
		Uncert:			+/-54.0						
		TPU:			+/-60.6						
Potassium-40				U	11.1	pCi/L					
		Uncert:			+/-107						
		TPU:			+/-107						
Sodium-22				U	14.8	pCi/L					
		Uncert:			+/-17.0						
		TPU:			+/-17.4						
QC1203938545	MB										
Cesium-137				U	-0.11	pCi/L			BSW1	12/14/1708:49	
		Uncert:			+/-0.992						
		TPU:			+/-0.992						
Cobalt-60				U	0.602	pCi/L					



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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	1726215										
Neptunium-237	Uncert:			+/-1.01							
	TPU:			+/-1.02							
			U	3.18	pCi/L						
	Uncert:			+/-1.92							
Potassium-40	TPU:			+/-2.06							
			U	21.5	pCi/L						
	Uncert:			+/-20.5							
	TPU:			+/-20.6							
Sodium-22			U	1.91	pCi/L						
	Uncert:			+/-0.957							
	TPU:			+/-1.06							
<b>Rad Gas Flow</b>											
Batch	1726106										
QC1203938212	439739003	DUP									
Strontium-90	U	0.159	U	0.196	pCi/L	0.0671		(0-1)	LXB3	12/20/17	14:22
**Strontium Carrier	Uncert:	+/-0.134		+/-0.138							
	TPU:	+/-0.134		+/-0.139							
	7.85	6.80		7.50	mg		95.5	(50%-105%)			
QC1203938214	LCS										
Strontium-90	23.6			23.6	pCi/L		99.9	(80%-120%)	LXB3	12/19/17	15:50
**Strontium Carrier	Uncert:			+/-0.687							
	TPU:			+/-2.01							
	7.85			7.00	mg		89.2	(50%-105%)			
QC1203938211	MB										
Strontium-90			U	0.0216	pCi/L				LXB3	12/19/17	15:50
**Strontium Carrier	Uncert:			+/-0.0796							
	TPU:			+/-0.0796							
	7.85			7.50	mg		95.5	(50%-105%)			
QC1203938213	439739003	MS									
Strontium-90	473	U	0.159	478	pCi/L		101	(75%-125%)	LXB3	12/19/17	15:50
**Strontium Carrier	Uncert:			+/-14.1							
	TPU:			+/-40.6							
	7.85			7.40	mg		94.3	(50%-105%)			
Batch	1726298										
QC1203938767	439739003	DUP									
Alpha		11.5		16.3	pCi/L	0.587		(0-1)	AXH4	12/19/17	10:58
Beta	Uncert:	+/-1.54		+/-1.78							
	TPU:	+/-1.84		+/-2.24							
		6.79		5.48	pCi/L	0.457		(0-1)		12/18/17	19:22
	Uncert:	+/-0.543		+/-0.459							
QC1203938770	TPU:	+/-0.786		+/-0.651							
	12.1			12.7	pCi/L		105	(80%-120%)	AXH4	12/19/17	10:58
	Uncert:			+/-0.585							
Alpha	TPU:			+/-1.24							

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Parname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gas Flow</b>											
Batch	1726298										
Beta	47.3			52.6	pCi/L		111	(80%-120%)			
	Uncert:			+/-0.940							
	TPU:			+/-4.62							
QC1203938766	MB										
Alpha			U	-0.145	pCi/L				AXH4	12/19/17	11:00
	Uncert:			+/-0.0649							
	TPU:			+/-0.0649							
Beta			U	-0.159	pCi/L					12/19/17	06:23
	Uncert:			+/-0.0934							
	TPU:			+/-0.0934							
QC1203938768	439739003	MS									
Alpha	483	11.5		574	pCi/L		116	(75%-125%)	AXH4	12/19/17	10:58
	Uncert:	+/-1.54		+/-28.5							
	TPU:	+/-1.84		+/-56.9							
Beta	1890	6.79		2070	pCi/L		109	(75%-125%)		12/19/17	06:23
	Uncert:	+/-0.543		+/-36.9							
	TPU:	+/-0.786		+/-176							
QC1203938769	439739003	MSD									
Alpha	483	11.5		557	pCi/L	0.0774	113	(0-1)	AXH4	12/19/17	10:58
	Uncert:	+/-1.54		+/-26.7							
	TPU:	+/-1.84		+/-54.2							
Beta	1890	6.79		1910	pCi/L	0.237	101	(0-1)		12/19/17	06:25
	Uncert:	+/-0.543		+/-34.1							
	TPU:	+/-0.786		+/-162							

### Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- 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.

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
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.

\*\* Indicates analyte is a surrogate/tracer compound.

^ 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.

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.