

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:

Revised data begins on page 367.





## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133288

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05/31/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:25		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <input checked="" type="radio"/> NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	MA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	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-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: NA

LOCATION COMMENTS: light Breeze while sampling

## FIELD PARAMETERS:

Sample Time	12:25	HH:MM	Dissolved Oxygen	5.50	Flow (in gpm)	2.94
Oxidation-Reduction Potential	154.8		pH	6.89	Specific Conductance	189.8
Temperature	16.2		Turbidity	1.53		

COLLECTED BY (PRINT): A. Vigil &amp; D. Jaramillo

RELINQUISHED BY (Printed Name) ANONON VIGIL (Signature) <i>[Signature]</i>	Date/Time 05/31/2017 13:15	RECEIVED BY (Printed Name) K. Green (Signature) <i>[Signature]</i>	Date/Time 5/31/17 13:15
	Date/Time		Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133278

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	5/31/2017	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1130		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	16-26644		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

Sample Time	11:30	HH:MM	Dissolved Oxygen	7.91 mg/L	Flow (in gpm)	0.64 gpm
Oxidation-Reduction Potential	163.6 mv		pH	6.55	Specific Conductance	167.2 us/cm
Temperature	11.7°C		Turbidity	6.5 NTU		

COLLECTED BY (PRINT): D. Hughes, K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>Katrina Tow</i>	Date/Time 5/31/17 1450	RECEIVED BY (Printed Name) (Signature)	S. Sherwood <i>S. Sherwood</i>	Date/Time 5/31/17 1450
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133306

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	5/31/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1130		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	16-26644		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes, K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Darren Hughes <i>[Signature]</i>	Date/Time 5/31/17 14:50	RECEIVED BY (Printed Name) (Signature)	Sherwood <i>[Signature]</i>	Date/Time 5/31/17 1400
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

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

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133316

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05/31/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:25		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil &amp; D. Jaramila

RELINQUISHED BY (Printed Name) ANDREW URGIL (Signature) Andrew Vigil	Date/Time 05/31/2017 1315	RECEIVED BY (Printed Name) K. G. Cane (Signature) [Signature]	Date/Time 5/31/17 1315
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133334

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	5/31/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1130		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	16-26644		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	FD	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	✓
BOTTOM DEPTH:	NA	↓	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- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes, K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 5/31/17 14:50	RECEIVED BY (Printed Name) (Signature)	Date/Time 5/31/17 14:50
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/30/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133336

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	5/31/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	11:30		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	16-26644		FIELD PREP:	UF	
LOCATION TYPE:	UA		FIELD QC TYPE:	FD	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	✓
BOTTOM DEPTH:	NA	✓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
Y	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
✓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	✓	✓

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes, K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 5/31/17 1450	RECEIVED BY (Printed Name) (Signature)	S. Sheppard <i>[Signature]</i>	Date/Time 5/31/17 1450
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133339

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05/31/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:25		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	DC	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	FB	
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	2	HCL	Y	NA
↓	WSP-8270C- SVOA	1 LITER AMBER GLASS	2	ICE	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil &amp; D. Jaramillo

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) <i>[Signature]</i>	Date/Time 05/31/2017 13:15	RECEIVED BY (Printed Name) K. Green (Signature) <i>[Signature]</i>	Date/Time 5/31/17 13:15
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-133342

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	05/31/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:25		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	DC	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		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	7	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil &amp; D. Jaramillo

RELINQUISHED BY (Printed Name) Andrew Vigil (Signature) <i>Andrew Vigil</i>	Date/Time 05/31/2017 13:15	RECEIVED BY (Printed Name) K. Green (Signature) <i>K. Green</i>	Date/Time 5/31/17 1:15
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-134191

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	5/31/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	8:54		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	16-26644		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	PEB	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8082-PCB	1 LITER AMBER GLASS	2	ms 5/31/17 ICE	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	2	ms 5/31/17 ICE		
	WSP-All Metals	1 LITER POLY	1	HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP- NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4		
	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: 11258

EVENT NAME: Water/CdV (TA16 260) Q3 MY2017

SAMPLE ID: CAWA-17-134191

WORK ORDER:

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes, K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 5/31/17 14:50	RECEIVED BY (Printed Name) (Signature)	Date/Time 5/31/17 14:50
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017



## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1633

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424596	EPA:120.1	2	1			
424596	EPA:150.1	2	1			
424596	EPA:160.1	2	1			
424596	EPA:170.0	4	2	1	1	
424596	EPA:245.2	4	2			
424596	EPA:300.0	2	1			
424596	EPA:310.1	2	1			
424596	EPA:335.4	2	1			
424596	EPA:350.1	2	1			
424596	EPA:351.2	2	1			
424596	EPA:353.2	2	1			
424596	EPA:365.4	2	1			
424596	EPA:900					
424596	EPA:901.1					
424596	EPA:905.0					
424596	HASL-300:AM-241					
424596	HASL-300:ISOPU					
424596	HASL-300:ISOU					
424596	SM:A2340B	2	1			
424596	SW-846:6010C	2	1			
424596	SW-846:6020	2	1			
424596	SW-846:6850	2	1			
424596	SW-846:8082					
424596	SW-846:8260B	1		1	1	
424596	SW-846:8270D	1			1	
424596	SW-846:8330B	2	1			
424596	SW-846:9060	2	1			

## 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
424596	EPA:120.1	1671823	1671823	2	1									1			2				
424596	EPA:150.1	1671988	1671988	2	1									1			2				
424596	EPA:160.1	1671087	1671087	2	1				1					1			2				
424596	EPA:170.0	NA	NA	4	2	1	1														
424596	EPA:245.2	1673477	1673474	4	2				1	2				1			2				
424596	EPA:300.0	1670735	1670735	2	1				1					1			1				
424596	EPA:310.1	1671987	1671987	2	1					1				2			1				
424596	EPA:335.4	1670760	1670759	2	1				1	1				1			1				
424596	EPA:350.1	1670372	1670371	2	1				1	1				1			1				
424596	EPA:351.2	1670378	1670377	2	1				1	1				1			1				
424596	EPA:353.2	1670096	1670096	2	1				1					1			1				
424596	EPA:365.4	1670383	1670381	2	1				1	1				1			1				
424596	EPA:900	1671754	1671754						1	1	1			1			1				
424596	EPA:901.1	1673943	1673943						1					1			1				
424596	EPA:905.0	1671753	1671753						1	1				1			1				
424596	HASL-300:AM-241	1670707	1670707						1					1			1				
424596	HASL-300:ISOPU	1670709	1670709						1					1			1				
424596	HASL-300:ISOU	1670711	1670711						1					1			1				
424596	SM:A2340B	1677826	1677826	2	1																
424596	SW-846:6010C	1670658	1670657	2	1				1	1				1			1				
424596	SW-846:6020	1670784	1670783	2	1				1	1				1			1				
424596	SW-846:6850	1670986	1670985	2	1				1	1	1			1							
424596	SW-846:8082	1672047	1672046						1	1				1	1						
424596	SW-846:8260B	1671196	1671196	1		1	1		4					7							
424596	SW-846:8270D	1670793	1670792	1			1		1	1	1			1							
424596	SW-846:8330B	1671746	1671745	2	1				1	1	1			1							
424596	SW-846:9060	1670679	1670679	2	1				1					1			1				

2. Distribution Of Analytes In EDD.



## 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-17-133306	1203805835	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133332	1203805836	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203805834	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133306	1203806296	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806297	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203806295	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133306	1203804103	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133334	1203804104	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203804102	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203804101	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133278	424596001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133288	424596008	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:170.0	VOC	CAWA-17-133336	424596004	FD	1	0	0	0
EPA:170.0	VOC	CAWA-17-133339	424596011	FB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133342	424596012	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-134191	424596005	PEB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810088	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810090	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810087	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810089	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133278	424596001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133288	424596009	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133334	424596003	FD	1	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAWA-17-133336	424596004	FD	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203810086	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203810085	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133316	1203803177	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203803176	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203803175	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806285	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806287	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203806283	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203808726	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133278	1203803259	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133278	1203803262	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133278	424596001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133288	424596009	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133336	424596004	FD	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203803258	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203803257	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133306	1203803278	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133306	1203803279	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203802235	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203802234	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133278	1203803289	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133278	1203803290	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133278	424596001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133288	424596009	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133336	424596004	FD	1	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203802249	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203802248	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-17-132988	1203801611	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203801610	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203801609	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133306	1203803294	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133306	1203803295	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133306	424596002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133316	424596010	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133334	424596003	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203802259	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203802258	MB	1	0	0	0
EPA:900	RAD	CAWA-17-134191	1203805588	DUP	2	0	0	0
EPA:900	RAD	CAWA-17-134191	1203805589	MS	0	0	2	0
EPA:900	RAD	CAWA-17-134191	1203805590	MSD	0	0	2	0
EPA:900	RAD	CAWA-17-134191	424596007	PEB	2	0	0	0
EPA:900	RAD	LCS	1203805591	LCS	0	0	2	0
EPA:900	RAD	MB	1203805587	MB	2	0	0	0
EPA:901.1	RAD	CAWA-17-134191	1203811245	DUP	5	0	0	0
EPA:901.1	RAD	CAWA-17-134191	424596007	PEB	5	0	0	0
EPA:901.1	RAD	LCS	1203811246	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203811244	MB	5	0	0	0
EPA:905.0	RAD	CAWA-17-134191	1203805584	DUP	1	0	0	0
EPA:905.0	RAD	CAWA-17-134191	1203805585	MS	0	0	1	0
EPA:905.0	RAD	CAWA-17-134191	424596007	PEB	1	0	0	0
EPA:905.0	RAD	LCS	1203805586	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203805583	MB	1	0	0	0
HASL-300:AM-241	RAD	CAWA-17-134191	1203803117	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-17-134191	424596007	PEB	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203803118	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203803116	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAWA-17-134191	1203803123	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-17-134191	424596007	PEB	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203803124	LCS	0	0	1	0



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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
HASL-300:ISOPU	RAD	MB	1203803122	MB	2	0	0	0
HASL-300:ISOU	RAD	CAWA-17-134191	1203803126	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-17-134191	424596007	PEB	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203803127	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203803125	MB	3	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133306	424596002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133316	424596010	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133334	424596003	FD	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-134191	424596007	PEB	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133306	1203802988	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133306	1203802989	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133306	424596002	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133316	424596010	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133334	424596003	FD	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-134191	424596007	PEB	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203802987	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203802986	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133306	1203803323	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133306	1203803324	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133306	424596002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133316	424596010	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133334	424596003	FD	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-134191	424596007	PEB	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203803322	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203803321	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132215	1203803790	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-17-132215	1203803791	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133306	424596002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133316	424596010	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133334	424596003	FD	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-134191	424596007	PEB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203803789	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203803788	MB	1	0	0	0
SW-846:8082	PESTPCB	CAWA-17-134191	424596005	PEB	8	2	0	0
SW-846:8082	PESTPCB	LCS	1203806424	LCS	0	2	2	0
SW-846:8082	PESTPCB	LCSD	1203806429	LCSD	0	2	2	0
SW-846:8082	PESTPCB	MB	1203806423	MB	8	2	0	0
SW-846:8082	PESTPCB	WST35-17-135775	1203806425	MS	0	2	2	0
SW-846:8260B	VOC	CAWA-17-133288	424596008	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-133339	424596011	FB	80	3	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8260B	VOC	CAWA-17-133342	424596012	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-134191	424596006	PEB	80	3	0	0
SW-846:8260B	VOC	LCS	1203804344	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203804345	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806304	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806305	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806750	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806751	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203807986	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203804343	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806303	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806749	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203807982	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-17-133288	424596008	REG	80	6	0	0
SW-846:8270D	SVOC	CAWA-17-133339	424596011	FB	80	6	0	0
SW-846:8270D	SVOC	CAWA-17-134191	1203803338	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-134191	1203803339	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-134191	424596006	PEB	80	6	0	0
SW-846:8270D	SVOC	LCS	1203803337	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203803336	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133278	424596001	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805559	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805560	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	424596009	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133336	424596004	FD	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-134191	424596007	PEB	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203805556	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133278	424596001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133288	424596009	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133336	424596004	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-134191	1203803830	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-134191	424596007	PEB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203803828	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203803827	MB	1	0	0	0

3. Are any analytes missing?

No.

## DATA VALIDATION REPORT

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203802234	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0406	J	mg/L	0.050
MB	1203802258	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0271	J	mg/L	0.050
MB	1203803321	METHOD BLANK	SW-846:6020	W	Uranium	0.134	J	ug/L	0.200
CAWA-17-133339	424596011	FIELD BLANK	EPA:170.0	W	Temperature	1		Deg C	
CAWA-17-133339	424596011	FIELD BLANK	SW-846:8260B	W	Methylene Chloride	1.71	J	ug/L	10.0
CAWA-17-133342	424596012	TRIP BLANK	EPA:170.0	W	Temperature	1		Deg C	
CAWA-17-133342	424596012	TRIP BLANK	SW-846:8260B	W	Methylene Chloride	1.94	J	ug/L	10.0

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-17-133306	1203802234	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0406	mg/L	0.0929		0.050	Y	5	100	Y
CAWA-17-133334	1203802234	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0406	mg/L	0.104		0.050	Y	5	100	Y
CAWA-17-134191	1203802234	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0406	mg/L	0.060		0.050	Y	5	100	Y
CAWA-17-133316	1203802234	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0406	mg/L	0.0941		0.050	Y	5	100	Y
CAWA-17-133306	1203802258	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0271	mg/L	0.039	J	0.050	Y	5	100	Y
CAWA-17-133334	1203802258	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0271	mg/L	0.0476	J	0.050	Y	5	100	Y
CAWA-17-134191	1203802258	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0271	mg/L	0.0319	J	0.050	Y	5	100	Y
CAWA-17-133316	1203802258	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0271	mg/L	0.0585		0.050	Y	5	100	Y
CAWA-17-133306	1203803321	METHOD BLANK	SW-846:6020	Uranium	0.134	ug/L	0.216		0.200	Y	5	100	Y
CAWA-17-133334	1203803321	METHOD BLANK	SW-846:6020	Uranium	0.134	ug/L	0.217		0.200	Y	5	100	Y



## DATA VALIDATION REPORT

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-17-133316	1203803321	METHOD BLANK	SW-846:6020	Uranium	0.134	ug/L	0.624		0.200	Y	5	100	Y
CAWA-17-133288	424596012	TRIP BLANK	SW-846:8260B	Methylene Chloride	1.94	ug/L	1.51	J	10.0	Y	5	100	Y
CAWA-17-133288	424596011	FIELD BLANK	SW-846:8260B	Methylene Chloride	1.71	ug/L	1.51	J	10.0	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

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
CAWA-17-133278	1203803290		EPA:351.2	Total Kjeldahl Nitrogen	1670377	06-07-2017	W	79		110	90	10		
CAWA-17-133278	1203803290		EPA:351.2	Total Kjeldahl Nitrogen	1670377	06-07-2017	W	79		110	90	10		
CAWA-17-134191	1203803338	1203803339	SW-846:8270D	Benzidine	1670792	06-05-2017	W	18	53	130	15		100	30
CAWA-17-134191	1203803338	1203803339	SW-846:8270D	Pyridine	1670792	06-05-2017	W	35	62	93	24		55	30
CAWA-17-133288	1203805559	1203805560	SW-846:8330B	RDX	1671745	06-10-2017	W	100	20	125	57		17	30
CAWA-17-133288	1203805559	1203805560	SW-846:8330B	TATB	1671745	06-10-2017	W	149	152	149	38		2	30

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

## DATA VALIDATION REPORT

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
1203805556		SW-846:8330B	Dinitrotoluene[2,6-]	1671745	06-09-2017	W	106		105	72				
1203805556		SW-846:8330B	TATB	1671745	06-09-2017	W	150		135	47				

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-17-133306	424596002	1203804103	EPA:160.1	Total Dissolved	W	149	134	mg/L	Y	Y	10.1	5
CAWA-17-133306	424596002	1203803278	EPA:350.1	Ammonia as	W	0.0929	0.074	mg/L	Y	Y	22.6	20

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	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
16-26644	2017-1633	CAWA-17-133278	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	UJ	I6a	N	0.100	mg/L	0.100	mg/L			W	05/31/2017		1670378	VAL	Y
CDV-9-1(i) S1	2017-1633	CAWA-17-133288	REG	INIT	VOC	SW-846:8260B	Methylene Chloride	U	U	V4d	N	1.51	ug/L	1.51	ug/L			W	05/31/2017		1671196	VAL	Y
16-26644	2017-1633	CAWA-17-133306	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0929	mg/L	0.0929	mg/L			W	05/31/2017		1670372	VAL	Y

## 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
16-26644	2017-1633	CAWA-17-133306	REG	INIT	GENERAL CHEMISTRY	EPA:160.1	Total Dissolved Solids	J	U	I10b	Y	149	mg/L	149	mg/L			W	05/31/2017		1671087	VAL	Y
16-26644	2017-1633	CAWA-17-133306	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.039	mg/L	0.039	mg/L			W	05/31/2017		1670383	VAL	Y
16-26644	2017-1633	CAWA-17-133306	REG	INIT	INORGANIC	SW-846:6020	Uranium		U	I4	N	0.216	ug/L	0.216	ug/L			W	05/31/2017		1670784	VAL	Y
CDV-9-1(i) S1	2017-1633	CAWA-17-133316	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0941	mg/L	0.0941	mg/L			W	05/31/2017		1670372	VAL	Y
CDV-9-1(i) S1	2017-1633	CAWA-17-133316	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0585	mg/L	0.0585	mg/L			W	05/31/2017		1670383	VAL	Y
CDV-9-1(i) S1	2017-1633	CAWA-17-133316	REG	INIT	INORGANIC	SW-846:6020	Uranium		U	I4	N	0.624	ug/L	0.624	ug/L			W	05/31/2017		1670784	VAL	Y
16-26644	2017-1633	CAWA-17-133334	FD	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.104	mg/L	0.104	mg/L			W	05/31/2017		1670372	VAL	Y
16-26644	2017-1633	CAWA-17-133334	FD	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0476	mg/L	0.0476	mg/L			W	05/31/2017		1670383	VAL	Y
16-26644	2017-1633	CAWA-17-133334	FD	INIT	INORGANIC	SW-846:6020	Uranium		U	I4	N	0.217	ug/L	0.217	ug/L			W	05/31/2017		1670784	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	-0.00775	pCi/L	-0.00775	pCi/L	0.0323	0.00671	W	05/31/2017		1670707	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.060	mg/L	0.060	mg/L			W	05/31/2017		1670372	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.436	pCi/L	-0.436	pCi/L	4.44	1.25	W	05/31/2017		1673943	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.846	pCi/L	0.846	pCi/L	5.08	1.18	W	05/31/2017		1673943	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-0.172	pCi/L	-0.172	pCi/L	1.43	0.325	W	05/31/2017		1671754	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	0.035	pCi/L	0.035	pCi/L	2.87	0.788	W	05/31/2017		1671754	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.16	pCi/L	-1.16	pCi/L	8.47	2.41	W	05/31/2017		1673943	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0217	pCi/L	0.0217	pCi/L	0.0371	0.0106	W	05/31/2017		1670709	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.0217	pCi/L	0.0217	pCi/L	0.0394	0.0141	W	05/31/2017		1670709	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-21.5	pCi/L	-21.5	pCi/L	51.9	13.9	W	05/31/2017		1673943	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	2.87	pCi/L	2.87	pCi/L	6.34	1.39	W	05/31/2017		1673943	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.126	pCi/L	0.126	pCi/L	0.201	0.0615	W	05/31/2017		1671753	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0319	mg/L	0.0319	mg/L			W	05/31/2017		1670383	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:ISOU	Uranium-234	U	U	R5	N	0.0184	pCi/L	0.0184	pCi/L	0.0785	0.0103	W	05/31/2017		1670711	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0318	pCi/L	0.0318	pCi/L	0.0769	0.0131	W	05/31/2017		1670711	VAL	Y
16-26644	2017-1633	CAWA-17-134191	PEB	INIT	RAD	HASL-300:ISOU	Uranium-238	U	U	R5	N	0.0184	pCi/L	0.0184	pCi/L	0.0812	0.0103	W	05/31/2017		1670711	VAL	Y

### Reason Code

### Description

I10b

The sample and/or the duplicate sample results RPD is not within the acceptance limits. Follow the external laboratory limits located within the associated data package

I4

the sample result is =<5x the concentration of related analyte in the method blank.

I6a

The associated matrix spike recovery was below the lower acceptance limit (LAL) but >10%. Follow the external laboratory limits located within the associated data package.

## DATA VALIDATION REPORT

### Reason Code

### Description

J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
U_LAB	The analytical laboratory qualified the analyte as not detected.
V4d	The samples result is $\leq 5$ x the concentration of the related analyte in the trip, rinsate and/or equipment blank.

### 14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133278	16-26644	REG	EPA:170.0	0	1
CAWA-17-133278	16-26644	REG	EPA:245.2	0	1
CAWA-17-133278	16-26644	REG	EPA:335.4	0	1
CAWA-17-133278	16-26644	REG	EPA:351.2	0	1
CAWA-17-133278	16-26644	REG	SW-846:8330B	0	20
CAWA-17-133278	16-26644	REG	SW-846:9060	0	1
CAWA-17-133288	CDV-9-1(i) S1	REG	EPA:170.0	0	1
CAWA-17-133288	CDV-9-1(i) S1	REG	EPA:245.2	0	1
CAWA-17-133288	CDV-9-1(i) S1	REG	EPA:335.4	0	1
CAWA-17-133288	CDV-9-1(i) S1	REG	EPA:351.2	0	1
CAWA-17-133288	CDV-9-1(i) S1	REG	SW-846:8260B	0	80
CAWA-17-133288	CDV-9-1(i) S1	REG	SW-846:8270D	0	80
CAWA-17-133288	CDV-9-1(i) S1	REG	SW-846:8330B	0	20
CAWA-17-133288	CDV-9-1(i) S1	REG	SW-846:9060	0	1
CAWA-17-133306	16-26644	REG	EPA:120.1	0	1
CAWA-17-133306	16-26644	REG	EPA:150.1	0	1
CAWA-17-133306	16-26644	REG	EPA:160.1	0	1
CAWA-17-133306	16-26644	REG	EPA:170.0	0	1
CAWA-17-133306	16-26644	REG	EPA:245.2	0	1
CAWA-17-133306	16-26644	REG	EPA:300.0	0	4
CAWA-17-133306	16-26644	REG	EPA:310.1	0	2
CAWA-17-133306	16-26644	REG	EPA:350.1	0	1
CAWA-17-133306	16-26644	REG	EPA:353.2	0	1
CAWA-17-133306	16-26644	REG	EPA:365.4	0	1
CAWA-17-133306	16-26644	REG	SM:A2340B	0	1



## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133306	16-26644	REG	SW-846:6010C	0	17
CAWA-17-133306	16-26644	REG	SW-846:6020	0	11
CAWA-17-133306	16-26644	REG	SW-846:6850	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:120.1	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:150.1	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:160.1	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:170.0	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:245.2	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:300.0	0	4
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:310.1	0	2
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:350.1	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:353.2	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	EPA:365.4	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	SM:A2340B	0	1
CAWA-17-133316	CDV-9-1(i) S1	REG	SW-846:6010C	0	17
CAWA-17-133316	CDV-9-1(i) S1	REG	SW-846:6020	0	11
CAWA-17-133316	CDV-9-1(i) S1	REG	SW-846:6850	0	1
CAWA-17-133334	16-26644	FD	EPA:120.1	0	1
CAWA-17-133334	16-26644	FD	EPA:150.1	0	1
CAWA-17-133334	16-26644	FD	EPA:160.1	0	1
CAWA-17-133334	16-26644	FD	EPA:170.0	0	1
CAWA-17-133334	16-26644	FD	EPA:245.2	0	1
CAWA-17-133334	16-26644	FD	EPA:300.0	0	4
CAWA-17-133334	16-26644	FD	EPA:310.1	0	2
CAWA-17-133334	16-26644	FD	EPA:350.1	0	1
CAWA-17-133334	16-26644	FD	EPA:353.2	0	1
CAWA-17-133334	16-26644	FD	EPA:365.4	0	1
CAWA-17-133334	16-26644	FD	SM:A2340B	0	1
CAWA-17-133334	16-26644	FD	SW-846:6010C	0	17
CAWA-17-133334	16-26644	FD	SW-846:6020	0	11
CAWA-17-133334	16-26644	FD	SW-846:6850	0	1
CAWA-17-133336	16-26644	FD	EPA:170.0	0	1
CAWA-17-133336	16-26644	FD	EPA:245.2	0	1
CAWA-17-133336	16-26644	FD	EPA:335.4	0	1
CAWA-17-133336	16-26644	FD	EPA:351.2	0	1
CAWA-17-133336	16-26644	FD	SW-846:8330B	0	20
CAWA-17-133336	16-26644	FD	SW-846:9060	0	1

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133339	CDV-9-1(i) S1	FB	EPA:170.0	0	1
CAWA-17-133339	CDV-9-1(i) S1	FB	SW-846:8260B	0	80
CAWA-17-133339	CDV-9-1(i) S1	FB	SW-846:8270D	0	80
CAWA-17-133342	CDV-9-1(i) S1	FTB	EPA:170.0	0	1
CAWA-17-133342	CDV-9-1(i) S1	FTB	SW-846:8260B	0	80
CAWA-17-134191	16-26644	PEB	EPA:120.1	0	1
CAWA-17-134191	16-26644	PEB	EPA:150.1	0	1
CAWA-17-134191	16-26644	PEB	EPA:160.1	0	1
CAWA-17-134191	16-26644	PEB	EPA:170.0	0	1
CAWA-17-134191	16-26644	PEB	EPA:245.2	0	1
CAWA-17-134191	16-26644	PEB	EPA:300.0	0	4
CAWA-17-134191	16-26644	PEB	EPA:310.1	0	2
CAWA-17-134191	16-26644	PEB	EPA:335.4	0	1
CAWA-17-134191	16-26644	PEB	EPA:350.1	0	1
CAWA-17-134191	16-26644	PEB	EPA:351.2	0	1
CAWA-17-134191	16-26644	PEB	EPA:353.2	0	1
CAWA-17-134191	16-26644	PEB	EPA:365.4	0	1
CAWA-17-134191	16-26644	PEB	EPA:900	0	2
CAWA-17-134191	16-26644	PEB	EPA:901.1	0	5
CAWA-17-134191	16-26644	PEB	EPA:905.0	0	1
CAWA-17-134191	16-26644	PEB	HASL-300:AM-241	0	1
CAWA-17-134191	16-26644	PEB	HASL-300:ISOPU	0	2
CAWA-17-134191	16-26644	PEB	HASL-300:ISOU	0	3
CAWA-17-134191	16-26644	PEB	SM:A2340B	0	1
CAWA-17-134191	16-26644	PEB	SW-846:6010C	0	17
CAWA-17-134191	16-26644	PEB	SW-846:6020	0	11
CAWA-17-134191	16-26644	PEB	SW-846:6850	0	1
CAWA-17-134191	16-26644	PEB	SW-846:8082	0	8
CAWA-17-134191	16-26644	PEB	SW-846:8260B	0	80
CAWA-17-134191	16-26644	PEB	SW-846:8270D	0	80
CAWA-17-134191	16-26644	PEB	SW-846:8330B	0	20
CAWA-17-134191	16-26644	PEB	SW-846:9060	0	1

## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1633 - Rev

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424596	SW-846:8330B	2	1			

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
424596	EPA:245.2	1673477	1673474							1							1				
424596	SW-846:8330B	1671746	1671745	2	1				1												

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAPA-17133354	1203810088	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810090	MS	0	0	1	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133278	424596001	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	424596009	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133336	424596004	FD	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-134191	424596007	PEB	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	3	0	0	0

### 3. Are any analytes missing?

No.

### 4. Were any holding times exceeded?

No.

### 5. Any contaminants in blanks?

## DATA VALIDATION REPORT

No.

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

**Reason Code**

**Description**



## DATA VALIDATION REPORT

### Reason Code

### Description

J\_LAB

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

NQ

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

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-17-133278	16-26644	REG	SW-846:8330B	0	3
CAWA-17-133288	CDV-9-1(i) S1	REG	SW-846:8330B	0	3
CAWA-17-133336	16-26644	FD	SW-846:8330B	0	3
CAWA-17-134191	16-26644	PEB	SW-846:8330B	0	3

June 27, 2017

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

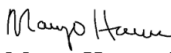
Re: LANL- WQH Water Samples  
Work Order: 424596  
SDG: 2017-1633

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 02, 2017, and analyzed for Explosives by LCMSMS, GC Semivolatile PCB, 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,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1633  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 424596**  
**SDG: 2017-1633**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 424596  
SDG # : 2017-1633**

**June 27, 2017**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 02, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. 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>
424596001	CAWA-17-133278
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596004	CAWA-17-133336
424596005	CAWA-17-134191
424596006	CAWA-17-134191
424596007	CAWA-17-134191
424596008	CAWA-17-133288
424596009	CAWA-17-133288
424596010	CAWA-17-133316
424596011	CAWA-17-133339
424596012	CAWA-17-133342

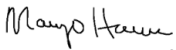
**Case Narrative**

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 Semivolatile PCB, 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.

  
Margo Herron for  
Valerie Davis  
Project Manager



**List of current GEL Certifications as of 27 June 2017**

<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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**

COC/Lab Request #:  
2017-1633  
Page 1 of 1

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Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424596</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/2/17</u>	
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 <u>5900 1782 1570-1°C</u> <u>5900 1782 1580-3°C</u> <u>5900 1782 1569-5°C</u> <u>5900 1782 1591-4°C</u>	
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>CPM</u> mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>Above</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" 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 checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: <u>Did not receive - 134191 WSP RAD container</u>
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<u>COC not relinquished</u>

Comments (Use Continuation Form if needed): MC

PM (or PMA) review: Initials

mett

Date

6/5/17

Page

1 of 1

GL-CHL-SR-001 Rev 5

SHIP DATE: 01JUN17  
ACTWGT: 43.0 LB MAN  
CAD: 0014176/CAFE2916

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

BILL SENDER

538C1/B734/3298

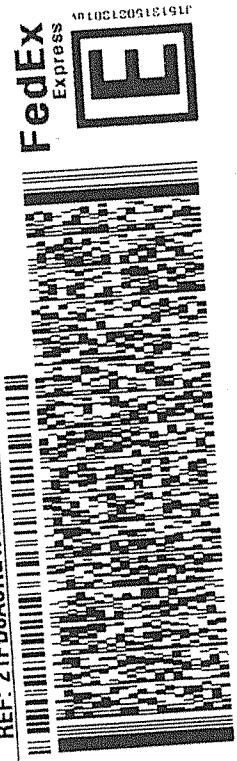
TO **VALERIE DAVIS**  
**GENERAL ENGINEERING LAB**  
**2040 SAVAGE RD**

LOS ALAMOS, NM 87545  
UNITED STATES US

3c

**CHARLESTON SC 29407**

(843) 566-8171  
REF: 21PD0ASRGW04BAGWEO



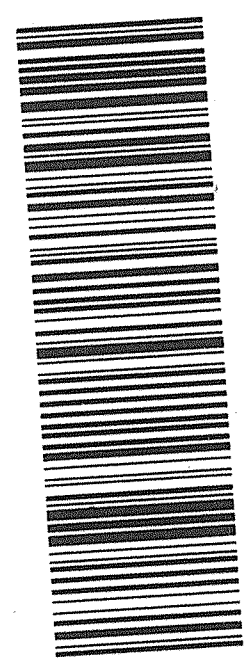
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**PRIORITY OVERNIGHT**

3 of 3  
MPS# 5908 1782 1580  
Mstr# 5908 1782 1569

0263

29407  
SC-US CHS

**X7 RBWA**



Part# 156148V-434 R1T2 06/15

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KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03

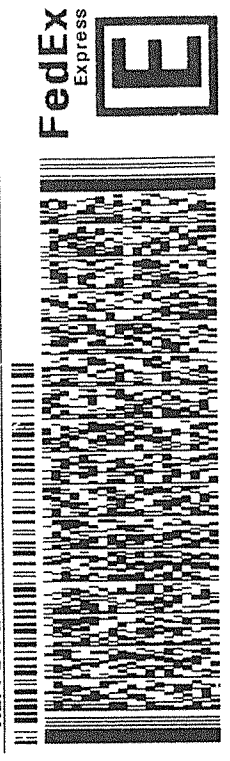
LOS ALAMOS, NM 87545  
UNITED STATES US

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

1c

**CHARLESTON SC 29407**

(843) 566-8171  
REF: 21PD0ASRGW04BAGWEO



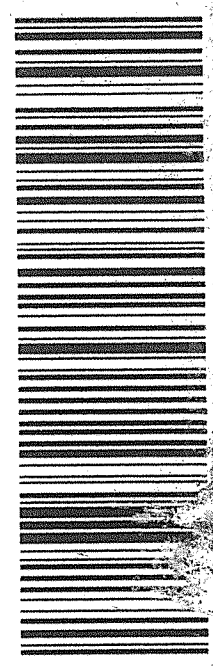
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2 of 3  
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0201

**X7 RBWA**

29407  
SC-US CHS



Part# 156148V-434 R1T2 06/15



06.07

RTU

ORIGIN ID: SAFA (505) 665-9961  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TAC0 BLDG 1237 DPU 03

FZ 0

SHIP DATE: 01 JUN 17  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

LOS ALAMOS, NM 87545  
UNITED STATES US

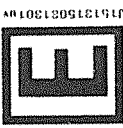
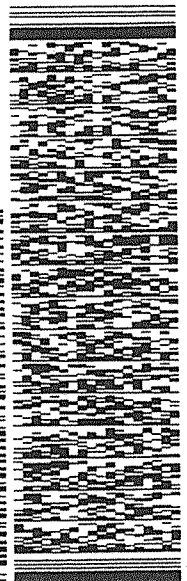
TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

SC

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO

FedEx  
Express



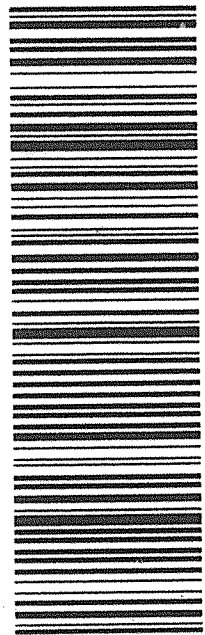
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PRIORITY OVERNIGHT

TRK# 5908 1782 1569

## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15

ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TAC0 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

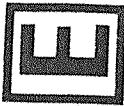
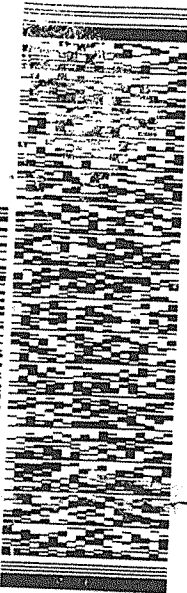
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

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CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO

FedEx  
Express

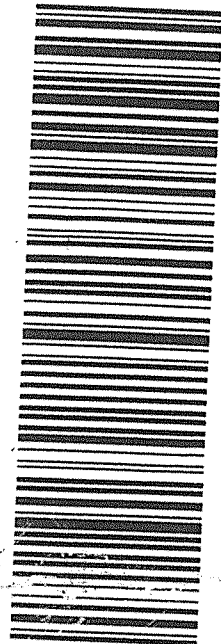


FRI - 02 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1782 1591

X7 PBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15

538C1/8734/329B

538C1/8734/329B

**Subject:** LANL ISSUES - Missing Signature and additional VOA Vials received

**From:** Margo Herron <Margo.Herron@gel.com>

**Date:** 6/6/2017 2:57 PM

**To:** Keith Robert Greene <kgreene@lanl.gov>

**CC:** "team.davis" <team.davis@gel.com>

Good Afternoon Keith,

For request number 2017-1633, this missing container came in today for sample CAWA-17-134191. Also the chain of custody was missing the relinquished signature.

For request number 2017-1649 Sample CAWA-17-133394 we received the two SVOA bottles as the chain indicates. We also received two VOA vials for that sample ID. There is no VOA test this sample on the chain of custody. Please advise.

Thanks,

Margo Herron

--

**Margo Herron**

**Project Manager Assistant**



Laboratories LLC

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

Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178

E-Mail: [Margo.Herron@gel.com](mailto:Margo.Herron@gel.com) | Website: [www.gel.com](http://www.gel.com)

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# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

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

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

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

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



# **Volatile Analysis**

# Case Narrative

**GC/MS Volatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch  
Number: 1671196

**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>
424596006	CAWA-17-134191
424596008	CAWA-17-133288
424596011	CAWA-17-133339
424596012	CAWA-17-133342
1203804346	424596006(CAWA-17-134191) Post Spike (PS)
1203804347	424596006(CAWA-17-134191) Post Spike (PS)
1203804348	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203804349	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203806749	Method Blank (MB)
1203806750	Laboratory Control Sample (LCS)
1203806751	Laboratory Control Sample (LCS)
1203807982	Method Blank (MB)
1203807986	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**

Target analytes were detected in the blank 1203807982 (MB) below the reporting limit.

##### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

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

Sample 424596006 (CAWA-17-134191) was designated for spike analysis.

##### **Matrix Spike/Matrix Spike Duplicate Recovery Statement**

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

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

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

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

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

#### **Technical Information**

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

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

##### **Sample Preservation and Integrity**

All samples met the sample preservation and integrity requirements.

##### **Sample Dilutions/Methanol Dilutions**

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

A Data exception reports (DERs) was not generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

##### **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>
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

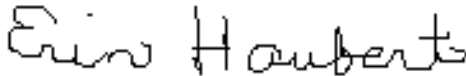
#### The Qualifiers in this report are defined as follows:

- \* 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: Erin Haubert

Date: 23 JUN 2017

Title: Data Validator



# **Sample Data Summary**

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596006</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-134191</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 12:17</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 12:17</b>				
<b>Data File:</b>	<b>060817V4\4L409.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:17	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:17		
<b>Data File:</b> 060817V4\4L409.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.24	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:17	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:17		
<b>Data File:</b> 060817V4\4L409.D	<b>Column:</b> DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.0	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	56.4	50.0	ug/L 113	(70%-131%)
Toluene-d8	50.9	50.0	ug/L 102	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	18.5	ug/L	0	J
	unknown siloxane	14.576	18.3	ug/L	0	J

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:46	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:46		
<b>Data File:</b> 060817V4\4L410.D	<b>Column:</b> DB-624	

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 12:25</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596008</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-133288</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 12:46</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 12:46</b>				
<b>Data File:</b>	<b>060817V4\4L410.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.51	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		1.07	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	J	0.540	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:46	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:46		
<b>Data File:</b> 060817V4\4L410.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	J	0.470	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.9	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	53.3	50.0	ug/L 107	(70%-131%)
Toluene-d8	50.4	50.0	ug/L 101	(74%-124%)

**Tentatively Identified Compound Summary**

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

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

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-133339

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Data File: 060817V4\4L411.D

Column: DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Data File: 060817V4\4L411.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.71	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-133339

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Data File: 060817V4\4L411.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	55.2	50.0	ug/L 110	(70%-131%)
Toluene-d8	49.0	50.0	ug/L 98	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	35.8	ug/L	0	J
	unknown siloxane	14.576	35.7	ug/L	0	J
	unknown	16.533	10.6	ug/L	0	J

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

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client ID: CAWA-17-133342

Batch ID: 1671196

Run Date: 06/08/2017 13:44

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client ID: CAWA-17-133342

Batch ID: 1671196

Run Date: 06/08/2017 13:44

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.94	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:44

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.0	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	55.0	50.0	ug/L 110	(70%-131%)
Toluene-d8	49.6	50.0	ug/L 99	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	5.79	ug/L	0	J
	unknown siloxane	14.576	8.03	ug/L	0	J

# **Quality Control Summary**



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

Page 1 of 1

**SDG Number: 2017-1633****Matrix Type: LIQUID**

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<b>Sample ID</b>	<b>Client ID</b>	<b>DCED4 %REC</b>	<b>TOL %REC</b>	<b>BFB %REC</b>
1203806750	LCS for batch 1671196	101	101	108
1203806751	LCS for batch 1671196	109	102	113
1203806749	MB for batch 1671196	106	101	111
424596006	CAWA-17-134191	104	102	113
424596008	CAWA-17-133288	104	101	107
424596011	CAWA-17-133339	107	98	110
424596012	CAWA-17-133342	104	99	110
1203804346	CAWA-17-134191PS	90	98	99
1203804348	CAWA-17-134191PSD	98	100	100
1203807986	LCS for batch 1671196	102	98	109
1203807982	MB for batch 1671196	97	98	109
1203804347	CAWA-17-134191PS	97	94	105
1203804349	CAWA-17-134191PSD	96	94	106

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**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 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	87.0	87	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	832	67	56-131
67-64-1	PS Acetone	250	0.00 U	96.3	39	25-155
74-88-4	PS Iodomethane	250	0.00 U	196	78	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	201	80	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	220	88	48-133
78-93-3	PS 2-Butanone	250	0.00 U	127	51	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	175	70	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	158	63	33-138
75-09-2	PS Methylene chloride	50.0	1.24 J	38.0	73	62-123
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	38.6	77	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.4	89	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.2	96	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.2	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.1	92	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.0	92	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	47.5	95	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	38.9	78	59-130
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	37.6	75	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	41.5	83	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.9	80	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	40.5	81	71-130
67-66-3	PS Chloroform	50.0	0.00 U	40.5	81	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	39.8	80	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	39.6	79	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	41.8	84	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	40.3	81	69-130
71-43-2	PS Benzene	50.0	0.00 U	40.0	80	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	41.0	82	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	41.5	83	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	39.8	80	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	42.2	84	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	40.3	81	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.0	82	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	42.5	85	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	39.3	79	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	39.4	79	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	40.8	82	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	37.6	75	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	40.1	80	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	41.0	82	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.8	86	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.4	89	62-131
100-42-5	PS Styrene	50.0	0.00 U	46.1	92	59-135
75-25-2	PS Bromoform	50.0	0.00 U	41.6	83	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	42.4	85	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	37.1	74	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	36.7	73	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	40.9	82	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	42.2	84	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	44.2	88	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	42.3	85	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	41.4	83	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	43.8	88	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	43.3	87	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	44.1	88	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	44.6	89	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	40.8	82	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	40.2	80	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	43.0	86	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	31.0	62	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	39.3	79	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	38.0	76	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	38.8	78	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	37.3	75	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	43.9	88	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	40.4	81	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	3980	80	60-140

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	84.4	84	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	975	78	56-131	16	0-20
67-64-1	PSD Acetone	250	0.00 U	112	45	25-155	15	0-20
74-88-4	PSD Iodomethane	250	0.00 U	198	79	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	198	79	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	239	95	48-133	8	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	148	59	25-143	15	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	201	81	61-127	14	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	178	71	33-138	12	0-20
75-09-2	PSD Methylene chloride	50.0	1.24 J	38.8	75	62-123	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	40.6	81	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	44.1	88	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	48.6	97	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	44.3	89	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	46.4	93	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	45.2	90	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.0	102	69-127	7	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	38.8	78	59-130	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	40.6	81	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	41.1	82	69-127	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.2	78	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	40.9	82	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	39.9	80	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	39.7	79	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	38.6	77	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	40.8	82	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	41.8	84	69-130	4	0-20
71-43-2	PSD Benzene	50.0	0.00 U	39.2	78	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	41.1	82	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	41.3	83	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	42.2	84	72-129	6	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	42.8	86	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	41.7	83	70-134	3	0-20
108-88-3	PSD Toluene	50.0	0.00 U	40.2	80	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	43.4	87	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	41.7	83	66-125	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	41.3	83	67-124	5	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	40.1	80	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	38.7	77	68-143	3	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	42.1	84	71-127	5	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	40.5	81	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	41.5	83	61-130	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	43.4	87	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	45.7	91	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	43.8	88	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	40.0	80	55-133	6	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	39.2	78	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	38.1	76	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	40.3	81	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	40.3	81	50-133	5	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	42.4	85	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	39.7	79	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	42.4	85	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	41.7	83	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	42.1	84	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	43.0	86	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	39.6	79	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	39.4	79	55-125	2	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	41.3	83	43-142	4	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	36.4	73	62-141	16	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	38.9	78	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	43.2	86	62-134	13	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	41.0	82	52-135	6	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.1	78	50-133	5	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	44.2	88	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	40.0	80	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4640	93	60-140	15	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804347

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:30

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS Acrolein	250	0.00 U	240	96	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	206	82	57-149
107-05-1	PS Allyl chloride	250	0.00 U	230	92	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	242	97	59-129
107-12-0	PS Propionitrile	250	0.00 U	240	96	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	247	99	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	249	99	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	244	98	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2450	98	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	35.4	71	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804349

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:59

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	240	96	49-141	0	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	210	84	57-149	2	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	235	94	54-128	2	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	242	97	59-129	0	0-20
107-12-0	PSD Propionitrile	250	0.00 U	234	94	58-131	3	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	251	100	59-134	1	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	252	101	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	251	100	60-136	3	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2450	98	60-143	0	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	37.2	74	63-146	5	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	88.8	89	71-127
75-05-8	LCS Acetonitrile	1250	0.0	948	76	61-125
67-64-1	LCS Acetone	250	0.0	263	105	48-157
74-88-4	LCS Iodomethane	250	0.0	210	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	213	85	69-138
108-05-4	LCS Vinyl acetate	250	0.0	245	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	226	90	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	208	83	66-124
591-78-6	LCS 2-Hexanone	250	0.0	246	98	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	45.6	91	40-160
74-87-3	LCS Chloromethane	50.0	0.0	39.4	79	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	44.0	88	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.6	93	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.4	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	53.8	108	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.4	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.8	88	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	38.9	78	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	43.0	86	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.3	89	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	44.0	88	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	47.8	96	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.2	84	76-125
67-66-3	LCS Chloroform	50.0	0.0	43.9	88	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.0	88	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.3	95	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	42.7	85	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.9	92	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.6	85	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	42.8	86	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	45.2	90	78-131
108-88-3	LCS Toluene	50.0	0.0	43.1	86	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.1	94	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	42.9	86	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.0	84	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	42.5	85	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.6	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	44.0	88	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.3	85	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.5	89	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.2	92	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.3	93	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.7	83	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	41.5	83	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	43.2	86	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	44.9	90	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	43.7	87	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.5	89	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.5	93	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.2	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.0	92	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	42.4	85	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	42.3	85	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	39.5	79	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	45.7	91	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	42.5	85	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	46.3	93	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.7	85	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4640	93	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806751

Instrument: VOA4.I

Analysis Date: 06/08/2017 10:50

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	291	116	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	248	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	256	102	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	259	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	264	106	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	257	103	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2650	106	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.9	84	66-147



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203807986

Instrument: VOA4.I

Analysis Date: 06/09/2017 14:13

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	279	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	238	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	251	100	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	264	106	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	266	106	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2710	108	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	42.3	85	66-147

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060817V4\4L407.D
Lab Sample ID:	1203806749	Prep Date:	06/08/2017 11:19	Analyzed:	06/08/17 11:19
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 1671196	1203806750	060817V4\4L403A.D	06/08/17	0924
02 LCS for batch 1671196	1203806751	060817V4\4L406A.D	06/08/17	1050
03 CAWA-17-134191	424596006	060817V4\4L409.D	06/08/17	1217
04 CAWA-17-133288	424596008	060817V4\4L410.D	06/08/17	1246
05 CAWA-17-133339	424596011	060817V4\4L411.D	06/08/17	1315
06 CAWA-17-133342	424596012	060817V4\4L412.D	06/08/17	1344
07 CAWA-17-134191PS	1203804346	060817V4\4L420.D	06/08/17	1735
08 CAWA-17-134191PSD	1203804348	060817V4\4L421.D	06/08/17	1804

## Method Blank Summary

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SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060917V4\4L508.D
Lab Sample ID:	1203807982	Prep Date:	06/09/2017 14:42	Analyzed:	06/09/17 14:42
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
10 LCS for batch 1671196	1203807986	060917V4\4L507A.D	06/09/17	1413
11 CAWA-17-134191PS	1203804347	060917V4\4L524.D	06/09/17	2230
12 CAWA-17-134191PSD	1203804349	060917V4\4L525.D	06/09/17	2259

# Quality Control Data

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		43.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		37.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		39.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		39.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		38.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		36.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		37.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		43.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		31.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		40.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		40.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.5	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		44.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		40.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		39.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		40.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.9	ug/L	0.300	1.00
78-93-3	2-Butanone		127	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		42.3	ug/L	0.300	1.00
591-78-6	2-Hexanone		158	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		41.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		44.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		175	ug/L	1.50	5.00
67-64-1	Acetone		96.3	ug/L	1.50	10.0
75-05-8	Acetonitrile		832	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		40.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.5	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.2	ug/L	0.300	1.00
75-25-2	Bromoform		41.6	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		201	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		41.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		41.0	ug/L	0.300	1.00
75-00-3	Chloroethane		46.1	ug/L	0.300	1.00
67-66-3	Chloroform		40.5	ug/L	0.300	1.00
74-87-3	Chloromethane		44.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		37.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		39.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		38.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		39.3	ug/L	0.300	1.00
74-88-4	Iodomethane		196	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		42.4	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.0	ug/L	1.00	10.0
91-20-3	Naphthalene		38.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.8	ug/L	0.300	1.00
108-88-3	Toluene		41.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		220	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		40.3	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		87.0	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		3980	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.2	ug/L	0.300	1.00
95-47-6	o-Xylene		44.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		44.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1633	<b>Date Collected:</b>	05/31/2017 08:54	<b>Matrix:</b>	W
<b>Lab Sample ID:</b>	1203804346	<b>Date Received:</b>	06/02/2017 09:00		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004	<b>Project:</b>	QC
<b>Client ID:</b>	CAWA-17-134191PS	<b>Method:</b>	SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b>	06/08/2017 17:35	<b>Analyst:</b>	VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b>	06/08/2017 17:35				
<b>Data File:</b>	060817V4\4L420.D	<b>Column:</b>	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		37.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		43.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		42.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.9	50.0	90	(71%-134%)
Bromofluorobenzene	49.6	50.0	99	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		35.4	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		230	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00



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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		244	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		247	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		249	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		240	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		206	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804347</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:30</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:30</b>				
<b>Data File:</b>	<b>060917V4\4L524.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	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.5	50.0	97	(71%-134%)
Bromofluorobenzene	52.5	50.0	105	(70%-131%)
Toluene-d8	46.8	50.0	94	(74%-124%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		44.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		39.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		41.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		38.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		41.0	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		38.1	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		39.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		41.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		36.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		42.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		41.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.3	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		42.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		39.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		41.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		39.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.2	ug/L	0.300	1.00
78-93-3	2-Butanone		148	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		40.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		178	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		39.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		43.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		201	ug/L	1.50	5.00
67-64-1	Acetone		112	ug/L	1.50	10.0
75-05-8	Acetonitrile		975	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		39.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.8	ug/L	0.300	1.00
75-25-2	Bromoform		43.8	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		44.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		198	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		40.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		40.5	ug/L	0.300	1.00
75-00-3	Chloroethane		46.4	ug/L	0.300	1.00
67-66-3	Chloroform		39.9	ug/L	0.300	1.00
74-87-3	Chloromethane		44.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		38.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		40.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		41.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		38.9	ug/L	0.300	1.00
74-88-4	Iodomethane		198	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		40.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.8	ug/L	1.00	10.0
91-20-3	Naphthalene		43.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		45.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.1	ug/L	0.300	1.00
108-88-3	Toluene		40.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		239	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.6	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		41.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		84.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		41.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		40.3	ug/L	0.300	1.00
95-47-6	o-Xylene		43.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		42.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		40.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		42.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		43.4	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.9	50.0	98	(71%-134%)
Bromofluorobenzene	49.9	50.0	100	(70%-131%)
Toluene-d8	49.8	50.0	100	(74%-124%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		235	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		251	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		251	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		252	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		234	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		210	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.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	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	96	(71%-134%)
Bromofluorobenzene	53.0	50.0	106	(70%-131%)
Toluene-d8	47.1	50.0	94	(74%-124%)



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

SDG Number: 2017-1633

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Matrix: WATER

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: MB for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 11:19

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Column: DB-624

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

Volatile  
Certificate of Analysis  
Sample Summary

Page 3 of 3

SDG Number:	2017-1633	Matrix:	WATER
Lab Sample ID:	1203806749		
Client Sample:	QC for batch 1671196	Client:	ARSL004
Client ID:	MB for batch 1671196	Method:	SW-846:8260B
Batch ID:	1671196	Inst:	VOA4.I
Run Date:	06/08/2017 11:19	Analyst:	VXY1
Prep Date:	06/08/2017 11:19		
Data File:	060817V4\4L407.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	55.5	50.0	ug/L 111	(70%-131%)
Toluene-d8	50.7	50.0	ug/L 101	(74%-124%)

## Tentatively Identified Compound Summary

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

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

SDG Number: 2017-1633

Matrix: WATER

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: LCS for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 09:24

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		46.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		42.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		41.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		42.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		39.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		44.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.6	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		42.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		226	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		43.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		246	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.5	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		208	ug/L	1.50	5.00
67-64-1	Acetone		263	ug/L	1.50	10.0
75-05-8	Acetonitrile		948	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		42.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		46.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		213	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		47.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		42.3	ug/L	0.300	1.00
75-00-3	Chloroethane		50.4	ug/L	0.300	1.00
67-66-3	Chloroform		43.9	ug/L	0.300	1.00
74-87-3	Chloromethane		39.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		41.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		45.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.4	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		44.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		210	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.9	ug/L	1.00	10.0
91-20-3	Naphthalene		45.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		42.5	ug/L	0.300	1.00
108-88-3	Toluene		43.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		45.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		245	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		44.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		45.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		88.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		44.9	ug/L	0.300	1.00
95-47-6	o-Xylene		44.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.0	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806750		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 09:24	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 09:24		
<b>Data File:</b>	060817V4\4L403A.D	<b>Column:</b>	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		43.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.5	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		45.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		47.1	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.5	50.0	101	(71%-134%)
Bromofluorobenzene	54.1	50.0	108	(70%-131%)
Toluene-d8	50.5	50.0	101	(74%-124%)

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

SDG Number: 2017-1633

Lab Sample ID: 1203806751

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 10:50

Prep Date: 06/08/2017 10:50

Data File: 060817V4\4L406A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		256	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203806751		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 10:50	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 10:50		
<b>Data File:</b> 060817V4\4L406A.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		257	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		259	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		264	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		248	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806751		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 10:50	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 10:50		
<b>Data File:</b>	060817V4\4L406A.D	<b>Column:</b>	DB-624
		<b>Project:</b>	QC
		<b>SOP Ref:</b>	GL-OA-E-038
		<b>Dilution:</b>	1
		<b>Purge Vol:</b>	5 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.4	50.0	ug/L 109	(71%-134%)
Bromofluorobenzene	56.6	50.0	ug/L 113	(70%-131%)
Toluene-d8	51.0	50.0	ug/L 102	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203807982</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/09/2017 14:42</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/09/2017 14:42</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060917V4\4L508.D</b>	<b>Column:</b>	<b>DB-624</b>

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203807982

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/09/2017 14:42

Prep Date: 06/09/2017 14:42

Data File: 060917V4\4L508.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.21	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b> 2017-1633	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807982		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:42		
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	97	(71%-134%)
Bromofluorobenzene	54.3	50.0	109	(70%-131%)
Toluene-d8	49.2	50.0	98	(74%-124%)

**Tentatively Identified Compound Summary**

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

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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203807986		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:13		
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		42.3	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		279	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		251	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807986			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:13			
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		261	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2710	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		266	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		269	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		264	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		238	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203807986		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/09/2017 14:13	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/09/2017 14:13		
<b>Data File:</b>	060917V4\4L507A.D	<b>Column:</b>	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	51.1	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	54.3	50.0	ug/L	109	(70%-131%)
Toluene-d8	48.9	50.0	ug/L	98	(74%-124%)

# **Semi-Volatile Analysis**



# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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:	1670793
Prep Batch Number:	1670792

**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>
424596006	CAWA-17-134191
424596008	CAWA-17-133288
424596011	CAWA-17-133339
1203803336	Method Blank (MB)
1203803337	Laboratory Control Sample (LCS)
1203803338	424596006(CAWA-17-134191) Matrix Spike (MS)
1203803339	424596006(CAWA-17-134191) 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 associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

#### **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 not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

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

Sample 424596006 (CAWA-17-134191) was selected for analysis as the matrix spike and matrix spike duplicate.

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

The MS and MSD recoveries were within the established acceptance limits.

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

The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data.

Sample	Analyte	Value
1203803338MS and 1203803339MSD (CAWA-17-134191)	Benzidine	100* (0%-30%)
	Pyridine	55* (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:**

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

A data exception report (DER) 1639374 was generated for sample 1203803339 (CAWA-17-134191MSD) in this SDG/batch.

##### **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 424596006 (CAWA-17-134191), 424596008 (CAWA-17-133288) and 424596011 (CAWA-17-133339) 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>
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MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)
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**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

#### 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: 28 JUN 2017

Title: Data Validator

# Sample Data Summary

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596006</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-134191</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 13:25</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>1000 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0508.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

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



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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596006</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-134191</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 13:25</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>1000 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0508.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

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

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:25	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 1000 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0508.D	<b>Column:</b> DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.8	100	ug/L	61	(32%-124%)
2-Fluorobiphenyl	33.1	50.0	ug/L	66	(32%-112%)
2-Fluorophenol	37.7	100	ug/L	38	(15%-88%)
Nitrobenzene-d5	34.7	50.0	ug/L	69	(36%-115%)
Phenol-d5	22.1	100	ug/L	22	(15%-91%)
p-Terphenyl-d14	33.8	50.0	ug/L	68	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	43.2	ug/L	97	NJ

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:52	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 960 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0511.D	<b>Column:</b> DB-5ms	

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

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 12:25</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596008</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-133288</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 14:52</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>960 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0511.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

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

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:52	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 960 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0511.D	<b>Column:</b> DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	77.5	104	ug/L	74	(32%-124%)
2-Fluorobiphenyl	39.8	52.1	ug/L	76	(32%-112%)
2-Fluorophenol	47.2	104	ug/L	45	(15%-88%)
Nitrobenzene-d5	41.9	52.1	ug/L	80	(36%-115%)
Phenol-d5	28.1	104	ug/L	27	(15%-91%)
p-Terphenyl-d14	43.5	52.1	ug/L	83	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	50.7	ug/L	97	NJ

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

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1670793

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	11.1	ug/L	3.33	11.1
120-82-1	1,2,4-Trichlorobenzene	U	11.1	ug/L	3.33	11.1
95-50-1	1,2-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
122-66-7	Azobenzene	U	11.1	ug/L	3.33	11.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
106-46-7	1,4-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
123-91-1	1,4-Dioxane	U	11.1	ug/L	3.33	11.1
90-12-0	1-Methylnaphthalene	U	1.11	ug/L	0.333	1.11
58-90-2	2,3,4,6-Tetrachlorophenol	U	11.1	ug/L	3.33	11.1
95-95-4	2,4,5-Trichlorophenol	U	11.1	ug/L	3.33	11.1
88-06-2	2,4,6-Trichlorophenol	U	11.1	ug/L	3.33	11.1
120-83-2	2,4-Dichlorophenol	U	11.1	ug/L	3.33	11.1
105-67-9	2,4-Dimethylphenol	U	11.1	ug/L	3.33	11.1
51-28-5	2,4-Dinitrophenol	U	22.2	ug/L	5.56	22.2
121-14-2	2,4-Dinitrotoluene	U	11.1	ug/L	3.33	11.1
606-20-2	2,6-Dinitrotoluene	U	11.1	ug/L	3.33	11.1
91-58-7	2-Chloronaphthalene	U	1.11	ug/L	0.456	1.11
95-57-8	2-Chlorophenol	U	11.1	ug/L	3.33	11.1
534-52-1	2-Methyl-4,6-dinitrophenol	U	11.1	ug/L	3.33	11.1
91-57-6	2-Methylnaphthalene	U	1.11	ug/L	0.333	1.11
88-75-5	2-Nitrophenol	U	11.1	ug/L	3.33	11.1
91-94-1	3,3'-Dichlorobenzidine	U	11.1	ug/L	3.33	11.1
101-55-3	4-Bromophenylphenylether	U	11.1	ug/L	3.33	11.1
59-50-7	Parachlorometa cresol	U	11.1	ug/L	3.33	11.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	11.1	ug/L	3.67	11.1
7005-72-3	4-Chlorophenylphenylether	U	11.1	ug/L	3.33	11.1
100-02-7	4-Nitrophenol	U	11.1	ug/L	3.33	11.1
83-32-9	Acenaphthene	U	1.11	ug/L	0.333	1.11
208-96-8	Acenaphthylene	U	1.11	ug/L	0.333	1.11
62-53-3	Aniline	U	11.1	ug/L	4.67	11.1
120-12-7	Anthracene	U	1.11	ug/L	0.333	1.11
1912-24-9	Atrazine	U	11.1	ug/L	3.33	11.1
92-87-5	Benzidine	U	11.1	ug/L	4.33	11.1
56-55-3	Benzo(a)anthracene	U	1.11	ug/L	0.333	1.11
50-32-8	Benzo(a)pyrene	U	1.11	ug/L	0.333	1.11
205-99-2	Benzo(b)fluoranthene	U	1.11	ug/L	0.333	1.11
191-24-2	Benzo(ghi)perylene	U	1.11	ug/L	0.333	1.11

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

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1670793

Inst: MSD3.I

Dilution: 1

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.11	ug/L	0.333	1.11
65-85-0	Benzoic acid	U	22.2	ug/L	6.67	22.2
100-51-6	Benzyl alcohol	U	11.1	ug/L	3.33	11.1
85-68-7	Butylbenzylphthalate	U	11.1	ug/L	3.33	11.1
218-01-9	Chrysene	U	1.11	ug/L	0.333	1.11
84-74-2	Di-n-butylphthalate	U	11.1	ug/L	3.33	11.1
117-84-0	Di-n-octylphthalate	U	11.1	ug/L	3.33	11.1
53-70-3	Dibenzo(a,h)anthracene	U	1.11	ug/L	0.333	1.11
132-64-9	Dibenzofuran	U	11.1	ug/L	3.33	11.1
84-66-2	Diethylphthalate	U	11.1	ug/L	3.33	11.1
131-11-3	Dimethylphthalate	U	11.1	ug/L	3.33	11.1
88-85-7	Dinoseb	U	11.1	ug/L	3.33	11.1
122-39-4	Diphenylamine	U	11.1	ug/L	3.33	11.1
206-44-0	Fluoranthene	U	1.11	ug/L	0.333	1.11
86-73-7	Fluorene	U	1.11	ug/L	0.333	1.11
118-74-1	Hexachlorobenzene	U	11.1	ug/L	3.33	11.1
87-68-3	Hexachlorobutadiene	U	11.1	ug/L	3.33	11.1
77-47-4	Hexachlorocyclopentadiene	U	11.1	ug/L	3.33	11.1
67-72-1	Hexachloroethane	U	11.1	ug/L	3.33	11.1
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.11	ug/L	0.333	1.11
78-59-1	Isophorone	U	11.1	ug/L	3.89	11.1
62-75-9	N-Methyl-N-nitrosomethylamine	U	11.1	ug/L	3.33	11.1
924-16-3	N-Nitrosodi-n-butylamine	U	11.1	ug/L	3.33	11.1
55-18-5	N-Nitrosodiethylamine	U	11.1	ug/L	3.33	11.1
621-64-7	N-Nitrosodi--n-propylamine	U	11.1	ug/L	3.33	11.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	11.1	ug/L	3.33	11.1
91-20-3	Naphthalene	U	1.11	ug/L	0.333	1.11
98-95-3	Nitrobenzene	U	11.1	ug/L	3.33	11.1
608-93-5	Pentachlorobenzene	U	11.1	ug/L	3.33	11.1
87-86-5	Pentachlorophenol	U	11.1	ug/L	3.33	11.1
85-01-8	Phenanthrene	U	1.11	ug/L	0.333	1.11
108-95-2	Phenol	U	11.1	ug/L	3.33	11.1
129-00-0	Pyrene	U	1.11	ug/L	0.333	1.11
110-86-1	Pyridine	U	11.1	ug/L	3.33	11.1
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	11.1	ug/L	3.33	11.1
111-91-1	bis(2-Chloroethoxy)methane	U	11.1	ug/L	3.33	11.1
111-44-4	bis(2-Chloroethyl) ether	U	11.1	ug/L	3.33	11.1
117-81-7	bis(2-Ethylhexyl)phthalate	U	11.1	ug/L	3.33	11.1

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

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SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1670793

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	11.1	ug/L	4.11	11.1
99-09-2	3-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	11.1	ug/L	3.33	11.1
88-74-4	2-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.0	111	ug/L	73 (32%-124%)
2-Fluorobiphenyl	45.1	55.6	ug/L	81 (32%-112%)
2-Fluorophenol	49.2	111	ug/L	44 (15%-88%)
Nitrobenzene-d5	47.4	55.6	ug/L	85 (36%-115%)
Phenol-d5	30.3	111	ug/L	27 (15%-91%)
p-Terphenyl-d14	44.1	55.6	ug/L	79 (36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	2.066	4.46	ug/L	0	J
000067-66-3	Trichloromethane	2.184	53.3	ug/L	97	NJ



# **Quality Control Summary**

Semi-Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1633

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203803336	MB for batch 1670792	48	29	87	82	80	93
1203803337	LCS for batch 1670792	42	27	68	72	80	70
424596006	CAWA-17-134191	38	22	69	66	61	68
1203803338	CAWA-17-134191MS	62	51	82	79	84	84
1203803339	CAWA-17-134191MSD	67	53	86	81	90	91
424596008	CAWA-17-133288	45	27	80	76	74	83
424596011	CAWA-17-133339	44	27	85	81	73	79

**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 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID:1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	50.0	0.0	21.3	43	30-88
110-86-1	LCS Pyridine	50.0	0.0	15.8	32	27-89
62-53-3	LCS Aniline	50.0	0.0	32.4	65	49-112
108-95-2	LCS Phenol	50.0	0.0	13.7	27	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	34.5	69	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	32.8	66	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	28.7	57	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	29.2	58	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	30.0	60	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	33.5	67	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	30.3	61	44-102
95-48-7	LCS o-Cresol	50.0	0.0	29.8	60	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	33.3	67	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	38.2	76	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	27.1	54	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	33.2	66	53-115
78-59-1	LCS Isophorone	50.0	0.0	33.6	67	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	31.3	63	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	30.8	62	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	33.9	68	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	33.3	67	53-109
65-85-0	LCS Benzoic acid	100	0.0	25.9	26	21-74

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	42.0	84	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	27.2	54	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	34.9	70	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	31.3	63	42-103
91-20-3	LCS Naphthalene	50.0	0.0	34.4	69	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	32.1	64	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	38.3	77	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	34.4	69	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	31.1	62	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	37.2	74	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	43.5	87	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	37.1	74	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	35.4	71	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	36.6	73	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	37.5	75	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	39.7	79	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	38.2	76	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	34.7	69	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	36.5	73	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	37.7	75	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	11.9	24	15-137

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	39.4	79	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	38.1	76	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	39.4	79	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	37.2	74	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	36.9	74	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	37.9	76	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	34.6	69	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	35.3	71	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	44.0	88	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.7	79	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.7	79	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	38.5	77	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	43.2	86	54-118
129-00-0	LCS Pyrene	50.0	0.0	35.4	71	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	33.8	68	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	36.9	74	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	40.1	80	57-112
218-01-9	LCS Chrysene	50.0	0.0	41.3	83	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	34.6	69	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	38.9	78	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	42.9	86	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	40.5	81	40-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	43.5	87	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	45.7	91	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	46.8	94	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	22.3	45	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	36.3	73	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	30.6	61	44-102
1912-24-9	LCS Atrazine	50.0	0.0	40.0	80	60-131
92-87-5	LCS Benzidine	100	0.0	33.8	34	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	38.0	76	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	28.8	58	39-99

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	120	0.00 U	77.6	64	25-106
110-86-1	MS Pyridine	120	0.00 U	42.6	35	24-93
62-53-3	MS Aniline	120	0.00 U	87.8	73	37-113
108-95-2	MS Phenol	120	0.00 U	63.1	52	23-82
111-44-4	MS bis(2-Chloroethyl) ether	120	0.00 U	92.8	77	39-114
95-57-8	MS 2-Chlorophenol	120	0.00 U	91.4	76	37-108
541-73-1	MS 1,3-Dichlorobenzene	120	0.00 U	79.3	66	27-97
106-46-7	MS 1,4-Dichlorobenzene	120	0.00 U	80.3	67	28-97
95-50-1	MS 1,2-Dichlorobenzene	120	0.00 U	83.1	69	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	120	0.00 U	92.2	77	32-127
100-51-6	MS Benzyl alcohol	120	0.00 U	93.6	78	37-116
95-48-7	MS o-Cresol	120	0.00 U	91.4	76	34-109
65794-96-9	MS m,p-Cresols	120	0.00 U	109	90	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	120	0.00 U	106	88	42-118
67-72-1	MS Hexachloroethane	120	0.00 U	75.7	63	29-94
98-95-3	MS Nitrobenzene	120	0.00 U	98.6	82	38-123
78-59-1	MS Isophorone	120	0.00 U	98.5	82	43-120
88-75-5	MS 2-Nitrophenol	120	0.00 U	96.2	80	39-115
105-67-9	MS 2,4-Dimethylphenol	120	0.00 U	92.1	76	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	120	0.00 U	102	84	42-118
120-83-2	MS 2,4-Dichlorophenol	120	0.00 U	99.3	82	40-111
65-85-0	MS Benzoic acid	241	0.00 U	122	51	17-95

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	120	0.00	U	123	102	44-138
87-68-3	MS	Hexachlorobutadiene	120	0.00	U	85.5	71	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	120	0.00	U	101	84	41-122
91-57-6	MS	2-Methylnaphthalene	120	0.00	U	97.1	81	29-109
91-20-3	MS	Naphthalene	120	0.00	U	105	88	31-108
90-12-0	MS	1-Methylnaphthalene	120	0.00	U	99.1	82	33-112
77-47-4	MS	Hexachlorocyclopentadiene	120	0.00	U	62.7	52	26-79
88-06-2	MS	2,4,6-Trichlorophenol	120	0.00	U	102	84	39-124
95-95-4	MS	2,4,5-Trichlorophenol	120	0.00	U	91.6	76	42-120
91-58-7	MS	2-Chloronaphthalene	120	0.00	U	89.2	74	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	120	0.00	U	95.7	79	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	120	0.00	U	112	93	42-144
131-11-3	MS	Dimethylphthalate	120	0.00	U	95.0	79	45-128
606-20-2	MS	2,6-Dinitrotoluene	120	0.00	U	91.7	76	46-124
121-14-2	MS	2,4-Dinitrotoluene	120	0.00	U	93.9	78	45-125
208-96-8	MS	Acenaphthylene	120	0.00	U	102	85	35-120
83-32-9	MS	Acenaphthene	120	0.00	U	110	92	35-117
51-28-5	MS	2,4-Dinitrophenol	120	0.00	U	98.9	82	27-122
132-64-9	MS	Dibenzofuran	120	0.00	U	95.3	79	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	120	0.00	U	97.1	81	40-128
84-66-2	MS	Diethylphthalate	120	0.00	U	96.5	80	43-127
100-02-7	MS	4-Nitrophenol	120	0.00	U	57.3	48	17-85



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	120	0.00	U	108	90	39-117
7005-72-3	MS	4-Chlorophenylphenylether	120	0.00	U	106	88	39-121
100-01-6	MS	4-Nitroaniline <i>p</i> -Nitroaniline	120	0.00	U	103	86	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	120	0.00	U	96.1	80	32-126
122-39-4	MS	Diphenylamine	120	0.00	U	96.1	80	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	120	0.00	U	102	84	38-120
101-55-3	MS	4-Bromophenylphenylether	120	0.00	U	95.4	79	39-121
118-74-1	MS	Hexachlorobenzene	120	0.00	U	94.0	78	40-118
87-86-5	MS	Pentachlorophenol	120	0.00	U	115	96	35-121
85-01-8	MS	Phenanthrene	120	0.00	U	104	86	40-115
120-12-7	MS	Anthracene	120	0.00	U	103	85	38-120
84-74-2	MS	Di-n-butylphthalate	120	0.00	U	96.5	80	41-128
206-44-0	MS	Fluoranthene	120	0.00	U	105	87	41-119
129-00-0	MS	Pyrene	120	0.00	U	107	89	35-128
85-68-7	MS	Butylbenzylphthalate	120	0.00	U	94.3	78	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	120	0.00	U	99.5	83	38-131
56-55-3	MS	Benzo(a)anthracene	120	0.00	U	103	85	39-120
218-01-9	MS	Chrysene	120	0.00	U	106	88	41-124
117-84-0	MS	Di-n-octylphthalate	120	0.00	U	84.7	70	37-134
205-99-2	MS	Benzo(b)fluoranthene	120	0.00	U	102	84	31-122
207-08-9	MS	Benzo(k)fluoranthene	120	0.00	U	114	95	33-123
50-32-8	MS	Benzo(a)pyrene	120	0.00	U	104	86	32-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	92.3	77	27-121
53-70-3	MS Dibenzo(a,h)anthracene	120	0.00 U	100	83	30-125
191-24-2	MS Benzo(ghi)perylene	120	0.00 U	102	85	24-126
123-91-1	MS 1,4-Dioxane	120	0.00 U	77.4	64	24-110
930-55-2	MS N-Nitrosopyrrolidine	120	0.00 U	105	87	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	120	0.00 U	90.2	75	32-101
1912-24-9	MS Atrazine	120	0.00 U	105	87	42-129
92-87-5	MS Benzidine	241	0.00 U	42.5	18	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	120	0.00 U	90.1	75	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	120	0.00 U	89.6	74	26-102

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	120	0.00 U	78.4	65	25-106	1	0-30
110-86-1	MSD Pyridine	120	0.00 U	75.3	62	24-93	55 *	0-30
62-53-3	MSD Aniline	120	0.00 U	100	83	37-113	13	0-30
108-95-2	MSD Phenol	120	0.00 U	62.6	52	23-82	1	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	120	0.00 U	95.4	79	39-114	3	0-30
95-57-8	MSD 2-Chlorophenol	120	0.00 U	93.3	77	37-108	2	0-30
541-73-1	MSD 1,3-Dichlorobenzene	120	0.00 U	82.0	68	27-97	3	0-30
106-46-7	MSD 1,4-Dichlorobenzene	120	0.00 U	83.4	69	28-97	4	0-30
95-50-1	MSD 1,2-Dichlorobenzene	120	0.00 U	85.8	71	28-99	3	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	120	0.00 U	95.6	79	32-127	4	0-30
100-51-6	MSD Benzyl alcohol	120	0.00 U	94.0	78	37-116	0	0-30
95-48-7	MSD o-Cresol	120	0.00 U	92.3	77	34-109	1	0-30
65794-96-9	MSD m,p-Cresols	120	0.00 U	111	92	36-120	2	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	120	0.00 U	108	90	42-118	2	0-30
67-72-1	MSD Hexachloroethane	120	0.00 U	79.1	66	29-94	4	0-30
98-95-3	MSD Nitrobenzene	120	0.00 U	98.7	82	38-123	0	0-30
78-59-1	MSD Isophorone	120	0.00 U	99.5	83	43-120	1	0-30
88-75-5	MSD 2-Nitrophenol	120	0.00 U	98.8	82	39-115	3	0-30
105-67-9	MSD 2,4-Dimethylphenol	120	0.00 U	93.4	78	39-107	1	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	120	0.00 U	101	84	42-118	0	0-30
120-83-2	MSD 2,4-Dichlorophenol	120	0.00 U	101	84	40-111	2	0-30
65-85-0	MSD Benzoic acid	241	0.00 U	119	49	17-95	2	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	124	103	44-138	1	0-30
87-68-3	MSD Hexachlorobutadiene	120	0.00 U	83.9	70	26-98	2	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	120	0.00 U	105	88	41-122	4	0-30
91-57-6	MSD 2-Methylnaphthalene	120	0.00 U	97.5	81	29-109	0	0-30
91-20-3	MSD Naphthalene	120	0.00 U	106	88	31-108	0	0-30
90-12-0	MSD 1-Methylnaphthalene	120	0.00 U	99.1	82	33-112	0	0-30
77-47-4	MSD Hexachlorocyclopentadiene	120	0.00 U	58.3	48	26-79	7	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	120	0.00 U	101	84	39-124	1	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	120	0.00 U	92.9	77	42-120	1	0-30
91-58-7	MSD 2-Chloronaphthalene	120	0.00 U	86.2	72	29-113	3	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	120	0.00 U	96.1	80	41-121	0	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	120	0.00 U	112	93	42-144	0	0-30
131-11-3	MSD Dimethylphthalate	120	0.00 U	95.9	80	45-128	1	0-30
606-20-2	MSD 2,6-Dinitrotoluene	120	0.00 U	92.1	76	46-124	0	0-30
121-14-2	MSD 2,4-Dinitrotoluene	120	0.00 U	95.2	79	45-125	1	0-30
208-96-8	MSD Acenaphthylene	120	0.00 U	100	83	35-120	2	0-30
83-32-9	MSD Acenaphthene	120	0.00 U	108	89	35-117	2	0-30
51-28-5	MSD 2,4-Dinitrophenol	120	0.00 U	98.9	82	27-122	0	0-30
132-64-9	MSD Dibenzofuran	120	0.00 U	94.4	78	38-113	1	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	120	0.00 U	99.5	83	40-128	2	0-30
84-66-2	MSD Diethylphthalate	120	0.00 U	97.7	81	43-127	1	0-30
100-02-7	MSD 4-Nitrophenol	120	0.00 U	55.0	46	17-85	4	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	107	89	39-117	1	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	120	0.00 U	105	87	39-121	1	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	120	0.00 U	101	83	30-133	3	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	120	0.00 U	95.6	79	32-126	1	0-30
122-39-4	MSD Diphenylamine	120	0.00 U	94.4	78	37-118	2	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	120	0.00 U	100	83	38-120	1	0-30
101-55-3	MSD 4-Bromophenylphenylether	120	0.00 U	93.5	78	39-121	2	0-30
118-74-1	MSD Hexachlorobenzene	120	0.00 U	93.6	78	40-118	0	0-30
87-86-5	MSD Pentachlorophenol	120	0.00 U	117	98	35-121	2	0-30
85-01-8	MSD Phenanthrene	120	0.00 U	104	86	40-115	0	0-30
120-12-7	MSD Anthracene	120	0.00 U	103	85	38-120	0	0-30
84-74-2	MSD Di-n-butylphthalate	120	0.00 U	98.6	82	41-128	2	0-30
206-44-0	MSD Fluoranthene	120	0.00 U	105	87	41-119	0	0-30
129-00-0	MSD Pyrene	120	0.00 U	110	92	35-128	3	0-30
85-68-7	MSD Butylbenzylphthalate	120	0.00 U	97.3	81	40-129	3	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	120	0.00 U	101	84	38-131	2	0-30
56-55-3	MSD Benzo(a)anthracene	120	0.00 U	104	87	39-120	2	0-30
218-01-9	MSD Chrysene	120	0.00 U	107	89	41-124	1	0-30
117-84-0	MSD Di-n-octylphthalate	120	0.00 U	83.3	69	37-134	2	0-30
205-99-2	MSD Benzo(b)fluoranthene	120	0.00 U	108	90	31-122	6	0-30
207-08-9	MSD Benzo(k)fluoranthene	120	0.00 U	118	98	33-123	3	0-30
50-32-8	MSD Benzo(a)pyrene	120	0.00 U	105	87	32-118	1	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	91.9	76	27-121	0	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	120	0.00 U	100	83	30-125	0	0-30
191-24-2	MSD Benzo(ghi)perylene	120	0.00 U	103	85	24-126	0	0-30
123-91-1	MSD 1,4-Dioxane	120	0.00 U	78.8	65	24-110	2	0-30
930-55-2	MSD N-Nitrosopyrrolidine	120	0.00 U	109	90	47-119	4	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	120	0.00 U	86.5	72	32-101	4	0-30
1912-24-9	MSD Atrazine	120	0.00 U	103	85	42-129	2	0-30
92-87-5	MSD Benzdine	241	0.00 U	128	53	15-130	100 *	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	120	0.00 U	92.3	77	34-124	2	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	120	0.00 U	89.1	74	26-102	1	0-30

## Method Blank Summary

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SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1670792	Instrument ID:	MSD3.I	Data File:	s060517.B\s3f0506.D
Lab Sample ID:	1203803336	Prep Date:	06/05/2017 04:55	Analyzed:	06/05/17 12:27
Column:	DB-5ms				

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 1670792	1203803337	s060517.B\s3f0507.D	06/05/17	1256
02 CAWA-17-134191	424596006	s060517.B\s3f0508.D	06/05/17	1325
03 CAWA-17-134191MS	1203803338	s060517.B\s3f0509.D	06/05/17	1354
04 CAWA-17-134191MSD	1203803339	s060517.B\s3f0510.D	06/05/17	1423
05 CAWA-17-133288	424596008	s060517.B\s3f0511.D	06/05/17	1452
06 CAWA-17-133339	424596011	s060517.B\s3f0512.D	06/05/17	1522

# Quality Control Data



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

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SDG Number: 2017-1633

Lab Sample ID: 1203803336

Client Sample: QC for batch 1670792

Client ID: MB for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:27

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0506.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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	10.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	10.0	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
122-66-7	Azobenzene	U	10.0	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	10.0	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	10.0	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	10.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	10.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	10.0	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	20.0	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	1.00	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	10.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.0	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	10.0	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	10.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	10.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	10.0	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	10.0	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	10.0	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	1.00	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	1.00	ug/L	0.300	1.00
62-53-3	Aniline	U	10.0	ug/L	4.20	10.0
120-12-7	Anthracene	U	1.00	ug/L	0.300	1.00
1912-24-9	Atrazine	U	10.0	ug/L	3.00	10.0
92-87-5	Benzidine	U	10.0	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	1.00	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	1.00	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	1.00	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Lab Sample ID: 1203803336

Client Sample: QC for batch 1670792

Client ID: MB for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:27

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0506.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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	1.00	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	20.0	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	10.0	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	10.0	ug/L	3.00	10.0
218-01-9	Chrysene	U	1.00	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	10.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	10.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	1.00	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	10.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	10.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	10.0	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	10.0	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	1.00	ug/L	0.300	1.00
86-73-7	Fluorene	U	1.00	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	10.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	10.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	10.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	10.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.00	ug/L	0.300	1.00
78-59-1	Isophorone	U	10.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine	U	10.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	10.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	10.0	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	1.00	ug/L	0.300	1.00
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
129-00-0	Pyrene	U	1.00	ug/L	0.300	1.00
110-86-1	Pyridine	U	10.0	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	10.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	10.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.0	ug/L	3.00	10.0

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

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**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203803336  
**Client Sample:** QC for batch 1670792  
**Client ID:** MB for batch 1670792  
**Batch ID:** 1670793  
**Run Date:** 06/05/2017 12:27  
**Prep Date:** 06/05/2017 04:55  
**Data File:** s060517.B\s3f0506.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD3.I  
**Analyst:** JLD1  
**Aliquot:** 1000 mL  
**Column:** DB-5ms

**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	U	10.0	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.0	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.5	100	ug/L	80	(32%-124%)
2-Fluorobiphenyl	40.9	50.0	ug/L	82	(32%-112%)
2-Fluorophenol	48.1	100	ug/L	48	(15%-88%)
Nitrobenzene-d5	43.7	50.0	ug/L	87	(36%-115%)
Phenol-d5	28.6	100	ug/L	29	(15%-91%)
p-Terphenyl-d14	46.3	50.0	ug/L	93	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	49.5	ug/L	97	NJ
	unknown	2.42	4.02	ug/L	0	J

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

SDG Number: 2017-1633

Lab Sample ID: 1203803337

Client Sample: QC for batch 1670792

Client ID: LCS for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:56

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0507.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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		30.6	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		28.8	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		30.0	ug/L	3.00	10.0
122-66-7	Azobenzene		37.9	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		28.7	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		29.2	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		22.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		32.1	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		36.5	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		34.4	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		38.3	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		33.3	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		30.8	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		38.2	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		36.6	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		35.4	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		31.1	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		32.8	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		37.2	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		31.3	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		31.3	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		38.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		34.6	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		34.9	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		42.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		38.1	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		11.9	ug/L	3.00	10.0
83-32-9	Acenaphthene		39.7	ug/L	0.300	1.00
208-96-8	Acenaphthylene		37.5	ug/L	0.300	1.00
62-53-3	Aniline		32.4	ug/L	4.20	10.0
120-12-7	Anthracene		39.7	ug/L	0.300	1.00
1912-24-9	Atrazine		40.0	ug/L	3.00	10.0
92-87-5	Benzidine		33.8	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		40.1	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		40.5	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		38.9	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		46.8	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Lab Sample ID: 1203803337

Client Sample: QC for batch 1670792

Client ID: LCS for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:56

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0507.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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		42.9	ug/L	0.300	1.00
65-85-0	Benzoic acid		25.9	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.3	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		33.8	ug/L	3.00	10.0
218-01-9	Chrysene		41.3	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		38.5	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		34.6	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		45.7	ug/L	0.300	1.00
132-64-9	Dibenzofuran		34.7	ug/L	3.00	10.0
84-66-2	Diethylphthalate		37.7	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		37.1	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		36.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		43.2	ug/L	0.300	1.00
86-73-7	Fluorene		39.4	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		35.3	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		27.2	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		20.9	ug/L	3.00	10.0
67-72-1	Hexachloroethane		27.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		43.5	ug/L	0.300	1.00
78-59-1	Isophorone		33.6	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		21.3	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		38.2	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		36.3	ug/L	3.00	10.0
91-20-3	Naphthalene		34.4	ug/L	0.300	1.00
98-95-3	Nitrobenzene		33.2	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		44.0	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.7	ug/L	0.300	1.00
108-95-2	Phenol		13.7	ug/L	3.00	10.0
129-00-0	Pyrene		35.4	ug/L	0.300	1.00
110-86-1	Pyridine		15.8	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		33.5	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		33.9	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		34.5	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		36.9	ug/L	3.00	10.0

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

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<b>SDG Number:</b> 2017-1633	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203803337	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1670792	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I
<b>Run Date:</b> 06/05/2017 12:56	<b>Analyst:</b> JLD1
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s060517.B\s3f0507.D	<b>Column:</b> DB-5ms
	<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		33.3	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		43.5	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		29.8	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		37.2	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		39.4	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.7	100	ug/L	80	(32%-124%)
2-Fluorobiphenyl	35.8	50.0	ug/L	72	(32%-112%)
2-Fluorophenol	42.0	100	ug/L	42	(15%-88%)
Nitrobenzene-d5	34.0	50.0	ug/L	68	(36%-115%)
Phenol-d5	26.8	100	ug/L	27	(15%-91%)
p-Terphenyl-d14	35.1	50.0	ug/L	70	(36%-121%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803338	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:54	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0509.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		90.2	ug/L	7.23	24.1
120-82-1	1,2,4-Trichlorobenzene		89.6	ug/L	7.23	24.1
95-50-1	1,2-Dichlorobenzene		83.1	ug/L	7.23	24.1
122-66-7	Azobenzene		102	ug/L	7.23	24.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		79.3	ug/L	7.23	24.1
106-46-7	1,4-Dichlorobenzene		80.3	ug/L	7.23	24.1
123-91-1	1,4-Dioxane		77.4	ug/L	7.23	24.1
90-12-0	1-Methylnaphthalene		99.1	ug/L	0.723	2.41
58-90-2	2,3,4,6-Tetrachlorophenol		97.1	ug/L	7.23	24.1
95-95-4	2,4,5-Trichlorophenol		91.6	ug/L	7.23	24.1
88-06-2	2,4,6-Trichlorophenol		102	ug/L	7.23	24.1
120-83-2	2,4-Dichlorophenol		99.3	ug/L	7.23	24.1
105-67-9	2,4-Dimethylphenol		92.1	ug/L	7.23	24.1
51-28-5	2,4-Dinitrophenol		98.9	ug/L	12.0	48.2
121-14-2	2,4-Dinitrotoluene		93.9	ug/L	7.23	24.1
606-20-2	2,6-Dinitrotoluene		91.7	ug/L	7.23	24.1
91-58-7	2-Chloronaphthalene		89.2	ug/L	0.988	2.41
95-57-8	2-Chlorophenol		91.4	ug/L	7.23	24.1
534-52-1	2-Methyl-4,6-dinitrophenol		96.1	ug/L	7.23	24.1
91-57-6	2-Methylnaphthalene		97.1	ug/L	0.723	2.41
88-75-5	2-Nitrophenol		96.2	ug/L	7.23	24.1
91-94-1	3,3'-Dichlorobenzidine		90.1	ug/L	7.23	24.1
101-55-3	4-Bromophenylphenylether		95.4	ug/L	7.23	24.1
59-50-7	Parachlorometa cresol		101	ug/L	7.23	24.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		123	ug/L	7.95	24.1
7005-72-3	4-Chlorophenylphenylether		106	ug/L	7.23	24.1
100-02-7	4-Nitrophenol		57.3	ug/L	7.23	24.1
83-32-9	Acenaphthene		110	ug/L	0.723	2.41
208-96-8	Acenaphthylene		102	ug/L	0.723	2.41
62-53-3	Aniline		87.8	ug/L	10.1	24.1
120-12-7	Anthracene		103	ug/L	0.723	2.41
1912-24-9	Atrazine		105	ug/L	7.23	24.1
92-87-5	Benzidine		42.5	ug/L	9.40	24.1
56-55-3	Benzo(a)anthracene		103	ug/L	0.723	2.41
50-32-8	Benzo(a)pyrene		104	ug/L	0.723	2.41
205-99-2	Benzo(b)fluoranthene		102	ug/L	0.723	2.41
191-24-2	Benzo(ghi)perylene		102	ug/L	0.723	2.41

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203803338</b>	<b>Date Received:</b>	<b>06/02/2017 12:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1670792</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191MS</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 13:54</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>415 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0509.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		114	ug/L	0.723	2.41
65-85-0	Benzoic acid		122	ug/L	14.5	48.2
100-51-6	Benzyl alcohol		93.6	ug/L	7.23	24.1
85-68-7	Butylbenzylphthalate		94.3	ug/L	7.23	24.1
218-01-9	Chrysene		106	ug/L	0.723	2.41
84-74-2	Di-n-butylphthalate		96.5	ug/L	7.23	24.1
117-84-0	Di-n-octylphthalate		84.7	ug/L	7.23	24.1
53-70-3	Dibenzo(a,h)anthracene		100	ug/L	0.723	2.41
132-64-9	Dibenzofuran		95.3	ug/L	7.23	24.1
84-66-2	Diethylphthalate		96.5	ug/L	7.23	24.1
131-11-3	Dimethylphthalate		95.0	ug/L	7.23	24.1
88-85-7	Dinoseb	U	24.1	ug/L	7.23	24.1
122-39-4	Diphenylamine		96.1	ug/L	7.23	24.1
206-44-0	Fluoranthene		105	ug/L	0.723	2.41
86-73-7	Fluorene		108	ug/L	0.723	2.41
118-74-1	Hexachlorobenzene		94.0	ug/L	7.23	24.1
87-68-3	Hexachlorobutadiene		85.5	ug/L	7.23	24.1
77-47-4	Hexachlorocyclopentadiene		62.7	ug/L	7.23	24.1
67-72-1	Hexachloroethane		75.7	ug/L	7.23	24.1
193-39-5	Indeno(1,2,3-cd)pyrene		92.3	ug/L	0.723	2.41
78-59-1	Isophorone		98.5	ug/L	8.43	24.1
62-75-9	N-Methyl-N-nitrosomethylamine		77.6	ug/L	7.23	24.1
924-16-3	N-Nitrosodi-n-butylamine	U	24.1	ug/L	7.23	24.1
55-18-5	N-Nitrosodiethylamine	U	24.1	ug/L	7.23	24.1
621-64-7	N-Nitrosodi--n-propylamine		106	ug/L	7.23	24.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		105	ug/L	7.23	24.1
91-20-3	Naphthalene		105	ug/L	0.723	2.41
98-95-3	Nitrobenzene		98.6	ug/L	7.23	24.1
608-93-5	Pentachlorobenzene	U	24.1	ug/L	7.23	24.1
87-86-5	Pentachlorophenol		115	ug/L	7.23	24.1
85-01-8	Phenanthrene		104	ug/L	0.723	2.41
108-95-2	Phenol		63.1	ug/L	7.23	24.1
129-00-0	Pyrene		107	ug/L	0.723	2.41
110-86-1	Pyridine		42.6	ug/L	7.23	24.1
108-60-1	bis(2-Chloro-1-methylethyl)ether		92.2	ug/L	7.23	24.1
111-91-1	bis(2-Chloroethoxy)methane		102	ug/L	7.23	24.1
111-44-4	bis(2-Chloroethyl) ether		92.8	ug/L	7.23	24.1
117-81-7	bis(2-Ethylhexyl)phthalate		99.5	ug/L	7.23	24.1



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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803338	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:54	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0509.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		109	ug/L	8.92	24.1
99-09-2	3-Nitroaniline		112	ug/L	7.23	24.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		91.4	ug/L	7.23	24.1
88-74-4	2-Nitroaniline		95.7	ug/L	7.23	24.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		103	ug/L	7.23	24.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	203	241	ug/L	84	(32%-124%)
2-Fluorobiphenyl	95.3	120	ug/L	79	(32%-112%)
2-Fluorophenol	150	241	ug/L	62	(15%-88%)
Nitrobenzene-d5	98.6	120	ug/L	82	(36%-115%)
Phenol-d5	122	241	ug/L	51	(15%-91%)
p-Terphenyl-d14	102	120	ug/L	84	(36%-121%)

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203803339</b>	<b>Date Received:</b>	<b>06/02/2017 12:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1670792</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191MSD</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 14:23</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>415 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0510.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		86.5	ug/L	7.23	24.1
120-82-1	1,2,4-Trichlorobenzene		89.1	ug/L	7.23	24.1
95-50-1	1,2-Dichlorobenzene		85.8	ug/L	7.23	24.1
122-66-7	Azobenzene		100	ug/L	7.23	24.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		82.0	ug/L	7.23	24.1
106-46-7	1,4-Dichlorobenzene		83.4	ug/L	7.23	24.1
123-91-1	1,4-Dioxane		78.8	ug/L	7.23	24.1
90-12-0	1-Methylnaphthalene		99.1	ug/L	0.723	2.41
58-90-2	2,3,4,6-Tetrachlorophenol		99.5	ug/L	7.23	24.1
95-95-4	2,4,5-Trichlorophenol		92.9	ug/L	7.23	24.1
88-06-2	2,4,6-Trichlorophenol		101	ug/L	7.23	24.1
120-83-2	2,4-Dichlorophenol		101	ug/L	7.23	24.1
105-67-9	2,4-Dimethylphenol		93.4	ug/L	7.23	24.1
51-28-5	2,4-Dinitrophenol		98.9	ug/L	12.0	48.2
121-14-2	2,4-Dinitrotoluene		95.2	ug/L	7.23	24.1
606-20-2	2,6-Dinitrotoluene		92.1	ug/L	7.23	24.1
91-58-7	2-Chloronaphthalene		86.2	ug/L	0.988	2.41
95-57-8	2-Chlorophenol		93.3	ug/L	7.23	24.1
534-52-1	2-Methyl-4,6-dinitrophenol		95.6	ug/L	7.23	24.1
91-57-6	2-Methylnaphthalene		97.5	ug/L	0.723	2.41
88-75-5	2-Nitrophenol		98.8	ug/L	7.23	24.1
91-94-1	3,3'-Dichlorobenzidine		92.3	ug/L	7.23	24.1
101-55-3	4-Bromophenylphenylether		93.5	ug/L	7.23	24.1
59-50-7	Parachlorometa cresol		105	ug/L	7.23	24.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		124	ug/L	7.95	24.1
7005-72-3	4-Chlorophenylphenylether		105	ug/L	7.23	24.1
100-02-7	4-Nitrophenol		55.0	ug/L	7.23	24.1
83-32-9	Acenaphthene		108	ug/L	0.723	2.41
208-96-8	Acenaphthylene		100	ug/L	0.723	2.41
62-53-3	Aniline		100	ug/L	10.1	24.1
120-12-7	Anthracene		103	ug/L	0.723	2.41
1912-24-9	Atrazine		103	ug/L	7.23	24.1
92-87-5	Benzidine		128	ug/L	9.40	24.1
56-55-3	Benzo(a)anthracene		104	ug/L	0.723	2.41
50-32-8	Benzo(a)pyrene		105	ug/L	0.723	2.41
205-99-2	Benzo(b)fluoranthene		108	ug/L	0.723	2.41
191-24-2	Benzo(ghi)perylene		103	ug/L	0.723	2.41

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203803339</b>	<b>Date Received:</b>	<b>06/02/2017 12:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1670792</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191MSD</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 14:23</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>415 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0510.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		118	ug/L	0.723	2.41
65-85-0	Benzoic acid		119	ug/L	14.5	48.2
100-51-6	Benzyl alcohol		94.0	ug/L	7.23	24.1
85-68-7	Butylbenzylphthalate		97.3	ug/L	7.23	24.1
218-01-9	Chrysene		107	ug/L	0.723	2.41
84-74-2	Di-n-butylphthalate		98.6	ug/L	7.23	24.1
117-84-0	Di-n-octylphthalate		83.3	ug/L	7.23	24.1
53-70-3	Dibenzo(a,h)anthracene		100	ug/L	0.723	2.41
132-64-9	Dibenzofuran		94.4	ug/L	7.23	24.1
84-66-2	Diethylphthalate		97.7	ug/L	7.23	24.1
131-11-3	Dimethylphthalate		95.9	ug/L	7.23	24.1
88-85-7	Dinoseb	U	24.1	ug/L	7.23	24.1
122-39-4	Diphenylamine		94.4	ug/L	7.23	24.1
206-44-0	Fluoranthene		105	ug/L	0.723	2.41
86-73-7	Fluorene		107	ug/L	0.723	2.41
118-74-1	Hexachlorobenzene		93.6	ug/L	7.23	24.1
87-68-3	Hexachlorobutadiene		83.9	ug/L	7.23	24.1
77-47-4	Hexachlorocyclopentadiene		58.3	ug/L	7.23	24.1
67-72-1	Hexachloroethane		79.1	ug/L	7.23	24.1
193-39-5	Indeno(1,2,3-cd)pyrene		91.9	ug/L	0.723	2.41
78-59-1	Isophorone		99.5	ug/L	8.43	24.1
62-75-9	N-Methyl-N-nitrosomethylamine		78.4	ug/L	7.23	24.1
924-16-3	N-Nitrosodi-n-butylamine	U	24.1	ug/L	7.23	24.1
55-18-5	N-Nitrosodiethylamine	U	24.1	ug/L	7.23	24.1
621-64-7	N-Nitrosodi--n-propylamine		108	ug/L	7.23	24.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		109	ug/L	7.23	24.1
91-20-3	Naphthalene		106	ug/L	0.723	2.41
98-95-3	Nitrobenzene		98.7	ug/L	7.23	24.1
608-93-5	Pentachlorobenzene	U	24.1	ug/L	7.23	24.1
87-86-5	Pentachlorophenol		117	ug/L	7.23	24.1
85-01-8	Phenanthrene		104	ug/L	0.723	2.41
108-95-2	Phenol		62.6	ug/L	7.23	24.1
129-00-0	Pyrene		110	ug/L	0.723	2.41
110-86-1	Pyridine		75.3	ug/L	7.23	24.1
108-60-1	bis(2-Chloro-1-methylethyl)ether		95.6	ug/L	7.23	24.1
111-91-1	bis(2-Chloroethoxy)methane		101	ug/L	7.23	24.1
111-44-4	bis(2-Chloroethyl) ether		95.4	ug/L	7.23	24.1
117-81-7	bis(2-Ethylhexyl)phthalate		101	ug/L	7.23	24.1

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803339	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:23	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0510.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		111	ug/L	8.92	24.1
99-09-2	3-Nitroaniline		112	ug/L	7.23	24.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		92.3	ug/L	7.23	24.1
88-74-4	2-Nitroaniline		96.1	ug/L	7.23	24.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		101	ug/L	7.23	24.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	216	241	ug/L	90 (32%-124%)
2-Fluorobiphenyl	98.1	120	ug/L	81 (32%-112%)
2-Fluorophenol	160	241	ug/L	67 (15%-88%)
Nitrobenzene-d5	104	120	ug/L	86 (36%-115%)
Phenol-d5	127	241	ug/L	53 (15%-91%)
p-Terphenyl-d14	110	120	ug/L	91 (36%-121%)

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 05-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> SEMIVOA GC/MS	<b>Test / Method:</b> SW846 3510C/8270D	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1670793	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633)</b> <b>Application Issues:</b> Failed RPD for MS/MSD, or PS/PSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for MS/MSD, or PS/PSD: QC 1203803339MSD		1. The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data. 1203803338MS and 1203803339MSD (CAWA-17-134191) Benzidine [100* (0%-30%)] and Pyridine [55* (0%-30%)].	

**Originator's Name:**

Josh Brooks 05-JUN-17

**Data Validator/Group Leader:**

Cameron Bearden 06-JUN-17

# **Perchlorates by LCMSMS Analysis**

# Case Narrative



**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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: 1670986

Prep Batch Number: 1670985

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
424596002	424596002 (CAWA-17-133306)
424596003	424596003 (CAWA-17-133334)
424596007	424596007 (CAWA-17-134191)
424596010	424596010 (CAWA-17-133316)
1203803792	Interference Check Sample (ICS)
1203803788	Method Blank (MB)
1203803789	Laboratory Control Sample (LCS)
1203803790	423831001(CAMO-17-132215) Matrix Spike (MS)
1203803791	423831001(CAMO-17-132215) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

## **Calibration Information**

### **Initial Calibration**

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

### **ICV Requirements**

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

### **CCB Requirements**

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

### **CCV Requirements**

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

### **Low Level Standard (CRI) Requirements**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The ICS spike recoveries met the acceptance criteria.

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

The LCS spike recoveries met the acceptance limits.

### **QC Sample Designation**

Client sample 423831001 (CAMO-17-132215) 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**

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

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

##### **Manual Integrations**

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: 2017-1633 GEL Work Order: 424596

#### 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: 06 JUN 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133306Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596002Date Filtered: 05-JUN-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	0.383	ug/L		1	05-JUN-17 20:29	per0605026a
	Perchlorate Isotope Ratio			2.75			1	05-JUN-17 20:29	per0605026a
14797-73-0	Perchlorate-101	.05	.2	0.409	ug/L		1	05-JUN-17 20:29	per0605026a
	Perchlorate-O(18)			0.536	ug/L		1	05-JUN-17 20:29	per0605026a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133334Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596003Date Filtered: 05-JUN-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	0.388	ug/L		1	05-JUN-17 20:38	per0605027a
	Perchlorate Isotope Ratio			2.73			1	05-JUN-17 20:38	per0605027a
14797-73-0	Perchlorate-101	.05	.2	0.417	ug/L		1	05-JUN-17 20:38	per0605027a
	Perchlorate-O(18)			0.504	ug/L		1	05-JUN-17 20:38	per0605027a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-134191Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596007Date Filtered: 05-JUN-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	0.200	ug/L	U	1	05-JUN-17 20:47	per0605028a
	Perchlorate Isotope Ratio						1	05-JUN-17 20:47	per0605028a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	05-JUN-17 20:47	per0605028a
	Perchlorate-O(18)			0.514	ug/L		1	05-JUN-17 20:47	per0605028a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133316Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596010Date Filtered: 05-JUN-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	0.430	ug/L		1	05-JUN-17 20:56	per0605029a
	Perchlorate Isotope Ratio			2.7			1	05-JUN-17 20:56	per0605029a
14797-73-0	Perchlorate-101	.05	.2	0.467	ug/L		1	05-JUN-17 20:56	per0605029a
	Perchlorate-O(18)			0.512	ug/L		1	05-JUN-17 20:56	per0605029a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

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

# **Quality Control Summary**

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2017-1633

Extract Batch Code: 1670985

Date Filtered: 05-JUN-17

Matrix: WATER

Sample ID: 1203803789

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		2.79				-
Perchlorate-101	0.200	.207	ug/L	104		85 - 115
Perchlorate-O(18)		.469	ug/L			-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

### Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2017-1633

**Extract Batch Code:** 1670985

**Date Extracted:** 05-JUN-17

**GEL MS/PS ID:** 1203803790

**Client ID:** CAMO-17-132215

**GEL MSD/PSD ID:** 1203803791

**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	0.346	ug/L	0.527	91	.514	84	2	30	75 - 125
Perchlorate Isotope Ratio	0	2.75		2.83		2.91		3		-
Perchlorate-101	0.200	0.369	ug/L	0.546	89	.519	75	5	30	75 - 125
Perchlorate-O(18)	0	0.480	ug/L	0.515		.517		0		-

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

# Quality Control Data

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 05-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803788Date Filtered: 05-JUN-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	0.200	ug/L	U	1	05-JUN-17 18:32	per0605013a
	Perchlorate Isotope Ratio						1	05-JUN-17 18:32	per0605013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	05-JUN-17 18:32	per0605013a
	Perchlorate-O(18)			0.483	ug/L		1	05-JUN-17 18:32	per0605013a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 05-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803789Date Filtered: 05-JUN-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	0.197	ug/L	J	1	05-JUN-17 18:41	per0605014a
	Perchlorate Isotope Ratio			2.79			1	05-JUN-17 18:41	per0605014a
14797-73-0	Perchlorate-101	.05	.2	0.207	ug/L		1	05-JUN-17 18:41	per0605014a
	Perchlorate-O(18)			0.469	ug/L		1	05-JUN-17 18:41	per0605014a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803792Date Filtered: 05-JUN-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	0.190	ug/L	J	1	05-JUN-17 18:50	per0605015a
	Perchlorate Isotope Ratio			2.71			1	05-JUN-17 18:50	per0605015a
14797-73-0	Perchlorate-101	.05	.2	0.205	ug/L		1	05-JUN-17 18:50	per0605015a
	Perchlorate-O(18)			0.512	ug/L		1	05-JUN-17 18:50	per0605015a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132215MSDate Received: 23-MAY-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803790Date Filtered: 05-JUN-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	0.527	ug/L		1	05-JUN-17 19:08	per0605017a
	Perchlorate Isotope Ratio			2.83			1	05-JUN-17 19:08	per0605017a
14797-73-0	Perchlorate-101	.05	.2	0.546	ug/L		1	05-JUN-17 19:08	per0605017a
	Perchlorate-O(18)			0.515	ug/L		1	05-JUN-17 19:08	per0605017a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132215MSDDate Received: 23-MAY-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803791Date Filtered: 05-JUN-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	0.514	ug/L		1	05-JUN-17 19:17	per0605018a
	Perchlorate Isotope Ratio			2.91			1	05-JUN-17 19:17	per0605018a
14797-73-0	Perchlorate-101	.05	.2	0.519	ug/L		1	05-JUN-17 19:17	per0605018a
	Perchlorate-O(18)			0.517	ug/L		1	05-JUN-17 19:17	per0605018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

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

# **Explosives by LCMSMS Analysis**

# Case Narrative

**Explosives by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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: 1671746

Prep Batch Number: 1671745

**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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) 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 calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB) and 424596007 (CAWA-17-134191) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

**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**

One or more of the required spiking analytes were not within the acceptance limits in the laboratory control sample (See Below). While the LCS exhibited a high bias, the analyte was/were not detected in the associated samples, the data are reported.

Sample	Analyte	Value
1203805556 (LCS)	2,6-Dinitrotoluene	106* (72%-105%)
	TATB	150* (47%-135%)

**QC Sample Designation**

Client sample 424596009 (CAWA-17-133288) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. Because the recoveries were biased high and target analytes were not detected in the associated samples above the reporting limit, the data were reported.

Sample	Analyte	Value
1203805560 (CAWA-17-133288MSD)	TATB	152* (38%-149%)

**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.

#### **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. Sample 424596009 (CAWA-17-133288) was further diluted to bring the over range concentration within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

	<b>424596</b>
Analyte	<b>009</b>
RDX	10X

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

1203805556 (LCS), 1203805559 (CAWA-17-133288MS), 1203805560 (CAWA-17-133288MSD), 424596001 (CAWA-17-133278), 424596004 (CAWA-17-133336) and 424596009 (CAWA-17-133288) were re-analyzed due to the bracketing CCV failing to meet the required acceptance criteria. The second analysis was bracketed by passing acceptance criteria.

#### **Miscellaneous Information**

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

Data exception report (DER) 1641799 was generated for samples 1203805556 (LCS) and 1203805560 (CAWA-17-133288MSD) in this SDG/batch.

##### **Manual Integrations**

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

##### **Additional Comments**

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

##### **System Configuration**

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

##### **Electronic Packaging Comment**

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and



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

#### **Chromatographic Columns**

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

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

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

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

#### 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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- 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 JUN 2017

Title: Group Leader

# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133278

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596001

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608054.wiff

Date Analyzed: 10-JUN-17 00:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.538	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	.835		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133278

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596001

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.08	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
99-35-4	1,3,5-Trinitrobenzene	1.54		0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	6.49		0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133336

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596004

Sample Amount 900 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608055.wiff

Date Analyzed: 10-JUN-17 00:47

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.278	U	0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.278	U	0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.278	U	0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.278	U	0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.278	U	0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.278	U	0.0911	0.278
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.278	U	0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.278	U	0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.278	U	0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.556	U	0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.556	U	0.111	0.556
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.556	U	0.167	0.556
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	.892		0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133336

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596004

Sample Amount 900 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.11	U	0.333	1.11
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.11	U	0.333	1.11
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.11	U	0.333	1.11
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
99-35-4	1,3,5-Trinitrobenzene	1.51		0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.78	U	0.556	2.78
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.78	U	0.556	2.78
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	6.77		0.0889	0.278
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-134191

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596007

Sample Amount 910 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608033.wiff

Date Analyzed: 09-JUN-17 11:55

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.275	U	0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.275	U	0.0879	0.275
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.275	U	0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.275	U	0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.275	U	0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.275	U	0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.275	U	0.0879	0.275
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.275	U	0.0901	0.275
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.275	U	0.0879	0.275
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.275	U	0.0879	0.275
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.275	U	0.0879	0.275
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.275	U	0.0879	0.275
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.549	U	0.0879	0.549
<i>479-45-8</i>	<i>Tetryl</i>				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-134191

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596007

Sample Amount 910 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.549	U	0.110	0.549
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.549	U	0.165	0.549
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.1	U	0.330	1.10
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.1	QU	0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.1	U	0.330	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.75	U	0.549	2.75
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.75	U	0.549	2.75
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-17-133288

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1633

**Matrix:** WATER

**GEL Sample ID:** 424596009

**Sample Amount** 930 mL

**Date Received:** 02-JUN-17

**Moisture:** .

**Extraction Batch ID:** 1671745

**Extraction Type** Sol Exchange

**Date Extracted:** 07-JUN-17

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0608056.wiff

**Date Analyzed:** 10-JUN-17 01:22

**Dilution Factor:** 10

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	20.8		0.430	1.34
121-82-4	RDX				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596009

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608057.wiff

Date Analyzed: 10-JUN-17 01:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0975	J	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.342		0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.446		0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.538	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596009

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.08	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	1.69		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

# **Quality Control Summary**

## High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2017-1633Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424596001	CAWA-17-133278	90	55 - 115	
424596004	CAWA-17-133336	85	55 - 115	
424596007	CAWA-17-134191	89	55 - 115	
424596009	CAWA-17-133288DL	97	55 - 115	
424596009	CAWA-17-133288	79	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

**3B**  
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1633

**Extract Batch Code:** 1671745

**Date Extracted:** 07-JUN-17

**GEL LCS ID:** 1203805556

**GEL LCSDUP ID:** .

**Analysis Date/Time:** 09-JUN-17 23:37

**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
tris(o-cresyl) phosphate	5	3.64	73					43 - 104
1,3,5-Trinitrobenzene	5	4.19	84					70 - 110
2,4,6-Trinitrotoluene	5	4.89	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	3.93	79					50 - 121
2,4-Dinitrotoluene	5	4.41	88					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.21	84					53 - 127
2,6-Dinitrotoluene	5	5.31	106 *					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.52	90					70 - 112
3,5-Dinitroaniline	5	6.02	120					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.76	95					74 - 116
HMX	5	3.92	78					58 - 113
Nitrobenzene	5	4.52	90					64 - 115
PETN	5	4.8	96					57 - 126
RDX	5	4	80					64 - 117
TATB	2.5	3.76	150 *					47 - 135
Tetryl	5	4.01	80					64 - 122
m-Dinitrobenzene	5	4.66	93					74 - 117
m-Nitrotoluene	5	4.63	93					66 - 114
o-Nitrotoluene	5	4.49	90					64 - 115
p-Nitrotoluene	5	4.84	97					66 - 127

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

\* Values outside of QC limits

3  
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL Spike ID: 1203805559

GEL SpikeDup ID: 1203805560

Analysis Date/Time: 10-JUN-17 02:32

MSD Analysis Date/Time: 10-JUN-17 03:07

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
4-Amino-2,6-dinitrotoluene	5.20833	.446	4.76	83	5.32	94	11	30	65 - 120
HMX	5.20833	1.69	6.44	91	6.47	92	1	30	44 - 128
Nitrobenzene	5.20833	0	4.27	82	4	77	6	30	62 - 116
PETN	5.20833	0	4.52	87	4.21	81	7	30	51 - 131
RDX	5.20833	21.2	26.4	100	22.2	20 *	17	30	57 - 125
TATB	2.60417	0	3.88	149	3.97	152 *	2	30	38 - 149
Tetryl	5.20833	0	3.82	73	3.79	73	1	30	50 - 126
m-Dinitrobenzene	5.20833	0	4.93	95	4.53	87	8	30	74 - 117
m-Nitrotoluene	5.20833	0	4.09	78	3.95	76	3	30	59 - 120
o-Nitrotoluene	5.20833	0	4.64	89	4.01	77	15	30	56 - 119
p-Nitrotoluene	5.20833	0	4.8	92	4.24	81	12	30	61 - 129
tris(o-cresyl) phosphate	5.20833	0	3.68	71	3.71	71	1	30	38 - 105
1,3,5-Trinitrobenzene	5.20833	0	4.34	83	4.11	79	5	30	67 - 111
2,4,6-Trinitrotoluene	5.20833	.0975	4.56	86	4.59	86	0	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.20833	0	5.74	110	6.16	118	7	30	50 - 121
2,4-Dinitrotoluene	5.20833	.0404	4.61	88	5.19	99	12	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.20833	0	5.42	104	5.58	107	3	30	53 - 127
2,6-Dinitrotoluene	5.20833	0	4.49	86	4.26	82	5	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.20833	.342	4.46	79	4.7	84	5	30	67 - 115
3,5-Dinitroaniline	5.20833	.103	5.81	110	5.72	108	2	30	70 - 121

#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 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.5	U	0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.5	U	0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1	U	0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1	QU	0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.64		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
3058-38-6	TATB	3.76		0.300	1.00
3058-38-6	TATB				
2691-41-0	HMX	3.92		0.080	0.250
2691-41-0	HMX				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.93		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
121-82-4	RDX	4		0.080	0.250
121-82-4	RDX				
479-45-8	Tetryl	4.01		0.080	0.500
479-45-8	Tetryl				
99-35-4	1,3,5-Trinitrobenzene	4.19		0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.21		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
121-14-2	2,4-Dinitrotoluene	4.41		0.080	0.250
121-14-2	2,4-Dinitrotoluene				
88-72-2	o-Nitrotoluene	4.49		0.082	0.250
88-72-2	o-Nitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.52		0.080	0.250
35572-78-2	2-Amino-4,6-dinitrotoluene				
98-95-3	Nitrobenzene	4.52		0.080	0.250
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	4.63		0.080	0.250
99-08-1	m-Nitrotoluene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.66		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
78-11-5	PETN	4.8		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.84		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.89		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	5.31		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	6.02		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.68		0.313	1.04
78-30-8	tris(o-cresyl) phosphate				
479-45-8	Tetryl	3.82		0.0833	0.521
479-45-8	Tetryl				
3058-38-6	TATB	3.88		0.313	1.04
3058-38-6	TATB				
99-08-1	m-Nitrotoluene	4.09		0.0833	0.260
99-08-1	m-Nitrotoluene				
98-95-3	Nitrobenzene	4.27		0.0833	0.260
98-95-3	Nitrobenzene				
99-35-4	1,3,5-Trinitrobenzene	4.34		0.0833	0.260
99-35-4	1,3,5-Trinitrobenzene				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.46		0.0833	0.260
35572-78-2	2-Amino-4,6-dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.49		0.0833	0.260
606-20-2	2,6-Dinitrotoluene				
78-11-5	PETN	4.52		0.104	0.521
78-11-5	PETN				
118-96-7	2,4,6-Trinitrotoluene	4.56		0.0833	0.260
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	4.61		0.0833	0.260
121-14-2	2,4-Dinitrotoluene				
88-72-2	o-Nitrotoluene	4.64		0.0854	0.260
88-72-2	o-Nitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.0833	0.260
19406-51-0	4-Amino-2,6-dinitrotoluene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	4.8		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.93		0.0833	0.260
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.42		0.521	2.60
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.74		0.521	2.60
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.81		0.313	1.04
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
2691-41-0	HMX	6.44		0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	26.4		0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.71		0.313	1.04
78-30-8	tris(o-cresyl) phosphate				
479-45-8	Tetryl	3.79		0.0833	0.521
479-45-8	Tetryl				
99-08-1	m-Nitrotoluene	3.95		0.0833	0.260
99-08-1	m-Nitrotoluene				
3058-38-6	TATB	3.97		0.313	1.04
3058-38-6	TATB				
98-95-3	Nitrobenzene	4		0.0833	0.260
98-95-3	Nitrobenzene				
88-72-2	o-Nitrotoluene	4.01		0.0854	0.260
88-72-2	o-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	4.11		0.0833	0.260
99-35-4	1,3,5-Trinitrobenzene				
78-11-5	PETN	4.21		0.104	0.521
78-11-5	PETN				
99-99-0	p-Nitrotoluene	4.24		0.156	0.521
99-99-0	p-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.26		0.0833	0.260
606-20-2	2,6-Dinitrotoluene				
99-65-0	m-Dinitrobenzene	4.53		0.0833	0.260
99-65-0	m-Dinitrobenzene				
118-96-7	2,4,6-Trinitrotoluene	4.59		0.0833	0.260
118-96-7	2,4,6-Trinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.7		0.0833	0.260
35572-78-2	2-Amino-4,6-dinitrotoluene				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	5.19		0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.32		0.0833	0.260
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.58		0.521	2.60
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.72		0.313	1.04
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.16		0.521	2.60
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	6.47		0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	22.2		0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1633Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: 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
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
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 08-JUN-17 22:28

**GEL Data File:** EXP0608010.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	3.64
tris(o-cresyl) phosphate	0	4.72
TATB	0	0
3,5-Dinitroaniline	0	3.86
2,4-Diamino-6-nitrotoluene	0	4.19
2,6-Diamino-4-nitrotoluene	0	4.27
DNX	0	0
MNX	0	0
TNX	0	3.53
1,3,5-Trinitrobenzene	0	3.75
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	4
2-Amino-4,6-dinitrotoluene	0	3.41
4-Amino-2,6-dinitrotoluene	0	3.74
HMX	0	0
Nitrobenzene	0	1.42
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	7.06

4A  
Explosives Continuing Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 09-JUN-17 00:49

**GEL Data File:** EXP0608014.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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	3.17
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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 09-JUN-17 04:54

GEL Data File: EXP0608021.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 09-JUN-17 07:15

GEL Data File: EXP0608025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 09-JUN-17 08:25

GEL Data File: EXP0608027.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0



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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 09-JUN-17 14:51

**GEL Data File:** EXP0608038.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	2.44
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 09-JUN-17 16:01

GEL Data File: EXP0608040.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 09-JUN-17 22:27

GEL Data File: EXP0608051.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 10-JUN-17 03:42

**GEL Data File:** EXP0608060.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	2.54
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0

# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 14-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LC-MS/MS	<b>Test / Method:</b> SW846 3535A/8330B	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1671746	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633),424732(2017-1648),424735(2017-1647),424739(2017-1645),424741(2017-1644)</b> <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD Failed Recovery for LCS/LCSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Two high recoveries were observed for 1203805556 (LCS). The recovery for 2,6-Dinitrotoluene was 106% (72%-105%) and for TATB, the recovery was 150% (47-135%).  2. A high recovery was observed for 1203805559 (MS). The recovery for TATB was 152% (38%-149%).		1. The high recoveries may be the result of vagaries in the extraction process and would suggest bias high detections. No reportable detections were observed in the associated samples.  2. The high recovery may be the result of vagaries in the extraction process. The high recovery was also observed in the batch LCS. No reportable detections were observed in the associated samples.	

**Originator's Name:**

Charles Wilson 14-JUN-17

**Data Validator/Group Leader:**

Michael Penny 14-JUN-17



# PCB Analysis

# Case Narrative

**GC Semivolatile PCB  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD

Analytical Method: SW846 3535A/8082

Prep Method: SW846 3535A

Analytical Batch Number: 1672047

Prep Batch Number: 1672046

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

<b>Sample ID</b>	<b>Client ID</b>
424596005	CAWA-17-134191
1203806423	Method Blank (MB)
1203806424	Laboratory Control Sample (LCS)
1203806429	Laboratory Control Sample Duplicate (LCSD)
1203806425	423945001(WST35-17-135775) Matrix Spike (MS)

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-040 REV# 24.

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

**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.

**Initial Calibration**

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

**Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were

within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

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

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

An LCSD analysis was performed for this batch of the samples.

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

The LCS/LCSD spike recoveries met the acceptance limits.

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

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

#### **QC Sample Designation**

Sample 423945001 (WST35-17-135775) was selected for the matrix spike analysis.

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

The MS/MSD recoveries were within the established acceptance limits.

### **Technical Information**

#### **Holding Time Specifications**

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

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

All samples and QC in this batch were cleaned using alumina in order to remove oil and other high molecular weight interferences. All samples and QC in this batch were cleaned with activated copper in order to remove sulfur. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

#### **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 for the samples reported in this batch.

### **Miscellaneous Information**

#### **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. 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.

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

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

#### **Manual integrations**

Manual integrations were not required for samples and QC samples associated with this SDG in this batch.

#### **Additional Comments**

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

#### **System Configuration**

The Semi-Volatiles-PCB 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>
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

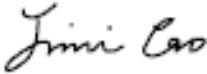
#### The Qualifiers in this report are defined as follows:

- \* 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: Jimin Cao

Date: 09 JUN 2017

Title: Data Validator

# **Sample Data Summary**

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596005	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> PCB	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 11:30	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 900 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0929.D	<b>Column:</b> 1 RTX-CLPEST 1	
	060917.S\E9f0929.D	2 RTX-CLPEST 2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.111	ug/L	0.037	0.111	1
11104-28-2	Aroclor-1221	U	0.111	ug/L	0.037	0.111	1
11141-16-5	Aroclor-1232	U	0.111	ug/L	0.037	0.111	1
53469-21-9	Aroclor-1242	U	0.111	ug/L	0.037	0.111	1
12672-29-6	Aroclor-1248	U	0.111	ug/L	0.037	0.111	1
11097-69-1	Aroclor-1254	U	0.111	ug/L	0.037	0.111	1
11096-82-5	Aroclor-1260	U	0.111	ug/L	0.037	0.111	1
37324-23-5	Aroclor-1262	U	0.111	ug/L	0.037	0.111	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.137	0.222	ug/L	62 (33%-122%)
Decachlorobiphenyl	0.198	0.222	ug/L	89 (35%-138%)



# **Quality Control Summary**

---

**PCB**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2017-1633****Matrix Type: LIQUID**

---

Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203806423	MB for batch 1672046	55	60	81	88
1203806424	LCS for batch 1672046	61	67	87	94
1203806429	LCSD for batch 1672046	65	71	91	98
1203806425	WST35-17-135775MS	60	64	88	95
424596005	CAWA-17-134191	62	67	89	95

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**Surrogate****Acceptance Limits**

4CMX    = 4cmx                   (33%-122%)

DCB       = Decachlorobiphenyl   (35%-138%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1672046

Matrix: WATER

Lab Sample ID 1203806424

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:22

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	LCS Aroclor-1016	1.00	0.0	0.668	67	45-101
11096-82-5	LCS Aroclor-1260	1.00	0.0	0.647	65	52-113

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 2 of 2

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1672046

Matrix: WATER

Lab Sample ID 1203806429

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:34

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
12674-11-2	LCSD Aroclor-1016	1.00	0.0	0.715	72	45-101	7	0-26
11096-82-5	LCSD Aroclor-1260	1.00	0.0	0.719	72	52-113	11	0-26

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: WST35-17-135775MS

Matrix: W

Lab Sample ID 1203806425

Instrument: ECD9A.I

Analysis Date: 06/09/2017 09:13

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	MS Aroclor-1016	1.28	0.00 U	0.882	69	26-110
11096-82-5	MS Aroclor-1260	1.28	0.00 U	0.866	68	30-127

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1672046	Instrument ID:	ECD9A.I_1	Data File:	060917.S\E9f0914.D
Lab Sample ID:	1203806423		ECD9A.I_2		060917.S\E9f0914.D
Column:	RTX-CLPEST 1	Prep Date:	06/08/2017 09:15	Analyzed:	06/09/17 08:10
	RTX-CLPEST 2				

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 1672046	1203806424	060917.S\E9f0915.D	06/09/17	0822
02 LCSD for batch 1672046	1203806429	060917.S\E9f0916.D	06/09/17	0834
03 WST35-17-135775MS	1203806425	060917.S\E9f0919.D	06/09/17	0913
04 CAWA-17-134191	424596005	060917.S\E9f0929.D	06/09/17	1130

# Quality Control Data

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203806423  
**Client Sample:** QC for batch 1672046  
**Client ID:** MB for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:10  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0914.D  
 060917.S\E9f0914.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.100	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260	U	0.100	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.109	0.200	55	(33%-122%)
Decachlorobiphenyl	0.162	0.200	81	(35%-138%)



**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203806424  
**Client Sample:** QC for batch 1672046  
**Client ID:** LCS for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:22  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0915.D  
 060917.S\E9f0915.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.668	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.647	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.122	0.200	61	(33%-122%)
Decachlorobiphenyl	0.175	0.200	87	(35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/22/2017 09:47	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203806425	<b>Date Received:</b> 05/24/2017 09:10	
<b>Client Sample:</b> QC for batch 1672046	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> WST35-17-135775MS	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 09:13	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 780 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0919.D	<b>Column:</b> 1 RTX-CLPEST 1	
060917.S\E9f0919.D	2 RTX-CLPEST 2	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.882	ug/L	0.0427	0.128	1
11104-28-2	Aroclor-1221	U	0.128	ug/L	0.0427	0.128	1
11141-16-5	Aroclor-1232	U	0.128	ug/L	0.0427	0.128	1
53469-21-9	Aroclor-1242	U	0.128	ug/L	0.0427	0.128	1
12672-29-6	Aroclor-1248	U	0.128	ug/L	0.0427	0.128	1
11097-69-1	Aroclor-1254	U	0.128	ug/L	0.0427	0.128	1
11096-82-5	Aroclor-1260		0.866	ug/L	0.0427	0.128	1
37324-23-5	Aroclor-1262	U	0.128	ug/L	0.0427	0.128	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.153	0.256	ug/L	60 (33%-122%)
Decachlorobiphenyl	0.225	0.256	ug/L	88 (35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203806429

Client Sample: QC for batch 1672046

Client ID: LCSD for batch 1672046

Batch ID: 1672047

Run Date: 06/09/2017 08:34

Prep Date: 06/08/2017 09:15

Data File: 060917.S\E9f0916.D

060917.S\E9f0916.D

Client: ARSL004

Method: SW846 3535A/8082

Inst: ECD9A.I

Analyst: YS1

Aliquot: 1000 mL

Column: 1 RTX-CLPEST 1

2 RTX-CLPEST 2

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-040

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.715	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.719	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.130	0.200	65	(33%-122%)
Decachlorobiphenyl	0.182	0.200	91	(35%-138%)

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1633**  
**Work Order #: 424596**

<b>Sample ID</b>	<b>Client ID</b>
424596001	CAWA-17-133278
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
424596010	CAWA-17-133316
1203802986	Method Blank (MB) <b>ICP</b>
1203802987	Laboratory Control Sample (LCS)
1203802990	424596002(CAWA-17-133306L) Serial Dilution (SD)
1203802988	424596002(CAWA-17-133306D) Sample Duplicate (DUP)
1203802989	424596002(CAWA-17-133306S) Matrix Spike (MS)
1203803321	Method Blank (MB) <b>ICP-MS</b>
1203803322	Laboratory Control Sample (LCS)
1203803325	424596002(CAWA-17-133306L) Serial Dilution (SD)
1203803323	424596002(CAWA-17-133306D) Sample Duplicate (DUP)
1203803324	424596002(CAWA-17-133306S) Matrix Spike (MS)
1203810085	Method Blank (MB) <b>CVAA</b>
1203810086	Laboratory Control Sample (LCS)
1203810091	424596001(CAWA-17-133278L) Serial Dilution (SD)
1203810087	424596001(CAWA-17-133278D) Sample Duplicate (DUP)
1203810089	424596001(CAWA-17-133278S) Matrix Spike (MS)

**Sample Analysis**

Samples 424596001,002,003,004,007,009 and 010 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1670658, 1670784, 1673477 and 1677826
<b>Prep Batch :</b>	1670657, 1670783 and 1673474
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

## **Preparation/Analytical Method Verification**

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

## **System Configuration**

The Hardness as CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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. 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191) and 424596010 (CAWA-17-133316)-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: 424596002 (CAWA-17-133306)-ICP and ICP-MS and 424596001 (CAWA-17-133278)-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**

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

**Technical Information****Holding Time Specifications**

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The 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.

**Data Exception (DER) Documentation**

A data exception report was not required for this SDG.

**Additional Comments**

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.



$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

#### **Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596

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

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

#### **Review/Validation**

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

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

**Signature:**



**Name: Nik-Cole Elmore**

**Date: 27 JUN 2017**

**Title: Data Validator**

# **Sample Data Summary**

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596001**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133278**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:08	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596002**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133306**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:17	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596002

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133306

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	352	ug/L		68	200	200	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:12	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-39-3	Barium	90.9	ug/L		1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-50-8	Copper	4.03	ug/L	J	3	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-89-6	Iron	147	ug/L		30	100	100	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7439-95-4	Magnesium	4590	ug/L		110	300	300	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-98-7	Molybdenum	0.445	ug/L	J	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-02-0	Nickel	1.57	ug/L	J	0.6	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-09-7	Potassium	2700	ug/L		50	150	150	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7631-86-9	Silica	36300	ug/L		53	213	213	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-23-5	Sodium	13100	ug/L		100	300	300	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-24-6	Strontium	89.7	ug/L		1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-61-1	Uranium	0.216	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:12	170622-3	1670784
7440-62-2	Vanadium	2.41	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596002**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133306**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.4	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596003**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133334**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:18	061417W1-4	1673477



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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596003

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133334

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	323	ug/L		68	200	200	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:18	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-39-3	Barium	92.7	ug/L		1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-50-8	Copper	3.21	ug/L	J	3	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-89-6	Iron	138	ug/L		30	100	100	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7439-95-4	Magnesium	4630	ug/L		110	300	300	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-98-7	Molybdenum	0.416	ug/L	J	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-02-0	Nickel	1.55	ug/L	J	0.6	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-09-7	Potassium	2620	ug/L		50	150	150	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7631-86-9	Silica	37000	ug/L		53	213	213	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-23-5	Sodium	13100	ug/L		100	300	300	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-24-6	Strontium	88.9	ug/L		1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-61-1	Uranium	0.217	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:18	170622-3	1670784
7440-62-2	Vanadium	2.4	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596003**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133334**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.6	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596004**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133336**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:20	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596007**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-134191**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:25	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596007

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-134191

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:19	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-39-3	Barium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-70-2	Calcium	200	ug/L	U	50	200	200	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7439-95-4	Magnesium	300	ug/L	U	110	300	300	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-98-7	Molybdenum	0.50	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-09-7	Potassium	150	ug/L	U	50	150	150	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7631-86-9	Silica	213	ug/L	U	53	213	213	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-23-5	Sodium	300	ug/L	U	100	300	300	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-24-6	Strontium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:19	170622-3	1670784
7440-62-2	Vanadium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596007**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-134191**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	1.24	mg/L	U	0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596009**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133288**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:27	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596010**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133316**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:29	061417W1-4	1673477



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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596010

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133316

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:20	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-39-3	Barium	5.08	ug/L		1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-42-8	Boron	34	ug/L	J	15	50	50	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-70-2	Calcium	13900	ug/L		50	200	200	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7439-95-4	Magnesium	4560	ug/L		110	300	300	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-98-7	Molybdenum	0.973	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-09-7	Potassium	1920	ug/L		50	150	150	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7631-86-9	Silica	46400	ug/L		53	213	213	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-23-5	Sodium	17000	ug/L		100	300	300	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-24-6	Strontium	87.2	ug/L		1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-61-1	Uranium	0.624	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:20	170622-3	1670784
7440-62-2	Vanadium	1.94	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596010**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133316**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.4	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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. 2017-1633

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>
1203802986	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
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
1203803321	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.134	ug/L	+/-0.2	J	MS	0.067	0.2
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596002 Spike ID: 1203802989

<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	5300		352		5000	98.9		P
Barium	ug/L	75-125	595		90.9		500	101		P
Beryllium	ug/L	75-125	501		1	U	500	100		P
Boron	ug/L	75-125	524		15	U	500	103		P
Calcium	ug/L	75-125	18800		13800		5000	99.8		P
Cobalt	ug/L	75-125	501		1	U	500	100		P
Copper	ug/L	75-125	522		4.03	J	500	104		P
Iron	ug/L	75-125	5370		147		5000	105		P
Magnesium	ug/L	75-125	9660		4590		5000	101		P
Manganese	ug/L	75-125	497		2	U	500	99.2		P
Potassium	ug/L	75-125	7560		2700		5000	97.2		P
Silica	ug/L	75-125	48200		36300		10700	111		P
Sodium	ug/L	75-125	18900		13100		5000	116		P
Strontium	ug/L	75-125	596		89.7		500	101		P
Tin	ug/L	75-125	506		2.5	U	500	101		P
Vanadium	ug/L	75-125	513		2.41	J	500	102		P
Zinc	ug/L	75-125	480		3.3	U	500	95.6		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596002 Spike ID: 1203803324

<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	49.7		1	U	50	99		MS
Arsenic	ug/L	75-125	53.5		2	U	50	104		MS
Cadmium	ug/L	75-125	48.6		0.3	U	50	97.2		MS
Chromium	ug/L	75-125	51.2		3	U	50	100		MS
Lead	ug/L	75-125	50.6		0.5	U	50	101		MS
Molybdenum	ug/L	75-125	50.5		0.445	J	50	100		MS
Nickel	ug/L	75-125	56.7		1.57	J	50	110		MS
Selenium	ug/L	75-125	50.2		2	U	50	100		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	47.4		0.6	U	50	94.5		MS
Uranium	ug/L	75-125	50.6		0.216		50	101		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1633 Client ID CAWA-17-133278S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596001 Spike ID: 1203810089

<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**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2017-1633

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133306D

Matrix: WATER

Level: Low

Sample ID: 424596002

Duplicate ID: 1203802988

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	352		318		9.93		P
Barium	ug/L	+/-20%	90.9		94.4		3.82		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	13800		14000		.971		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L	+/-10	4.03 J		4.02 J		.31		P
Iron	ug/L	+/-100	147		143		2.96		P
Magnesium	ug/L	+/-20%	4590		4640		1.16		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	2700		2670		1.03		P
Silica	ug/L	+/-20%	36300		37600		3.38		P
Sodium	ug/L	+/-20%	13100		13600		3.19		P
Strontium	ug/L	+/-20%	89.7		91.1		1.59		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	2.41 J		3.27 J		30		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C



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

SDG No.: 2017-1633

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133306D

Matrix: WATER

Level: Low

Sample ID: 424596002

Duplicate ID: 1203803323

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		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.445 J		0.451 J		1.34		MS
Nickel	ug/L	+/- 2	1.57 J		1.49 J		5.36		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	+/- .2	0.216		0.21		2.82		MS

\*Analytical Methods:

MS SW846 3005A/6020A

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

**SDG No.:** 2017-1633**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-17-133278D**Matrix:** WATER**Level:** Low**Sample ID:** 424596001**Duplicate ID:** 1203810087**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

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## Laboratory Control Sample Summary

SDG NO. 2017-1633

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>
1203802987								
	Aluminum	ug/L	5000	4780		95.7	80-120	P
	Barium	ug/L	500	486		97.3	80-120	P
	Beryllium	ug/L	500	480		96	80-120	P
	Boron	ug/L	500	490		98.1	80-120	P
	Calcium	ug/L	5000	4760		95.1	80-120	P
	Cobalt	ug/L	500	490		98.1	80-120	P
	Copper	ug/L	500	490		98	80-120	P
	Iron	ug/L	5000	4900		98	80-120	P
	Magnesium	ug/L	5000	4900		97.9	80-120	P
	Manganese	ug/L	500	485		97.1	80-120	P
	Potassium	ug/L	5000	4920		98.5	80-120	P
	Silica	ug/L	10700	10100		94.2	80-120	P
	Sodium	ug/L	5000	4940		98.9	80-120	P
	Strontium	ug/L	500	474		94.9	80-120	P
	Tin	ug/L	500	486		97.1	80-120	P
	Vanadium	ug/L	500	486		97.2	80-120	P
	Zinc	ug/L	500	464		92.8	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1633

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203803322								
	Antimony	ug/L	50	48.8		97.5	80-120	MS
	Arsenic	ug/L	50	51.9		104	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	48.8		97.6	80-120	MS
	Lead	ug/L	50	50.7		101	80-120	MS
	Molybdenum	ug/L	50	50.7		101	80-120	MS
	Nickel	ug/L	50	52.6		105	80-120	MS
	Selenium	ug/L	50	50.7		101	80-120	MS
	Silver	ug/L	50	51.8		104	80-120	MS
	Thallium	ug/L	50	47		94	80-120	MS
	Uranium	ug/L	50	48.9		97.8	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1633

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>
1203810086	Mercury	ug/L	2	2.04		102	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 424596002 Serial Dilution ID: 1203802990

<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	352		353	J	.344			P
Barium	90.9		92.8		2.107		10	P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	13800		13800		.423		10	P
Cobalt	1	U	5	U				P
Copper	4.03	J	15	U	23.705			P
Iron	147		163	J	11.239			P
Magnesium	4590		4520		1.577			P
Manganese	2	U	10	U				P
Potassium	2700		2810		4.172		10	P
Silica	36300		35800		1.545		10	P
Sodium	13100		13500		2.884		10	P
Strontium	89.7		92.3		2.967		10	P
Tin	2.5	U	12.5	U				P
Vanadium	2.41	J	5	U	29.942			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2017-1633

Client ID: CAWA-17-133306L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424596002

Serial Dilution ID: 1203803325

<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	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.445	J	1	U	25.843			MS
Nickel	1.57	J	3	U	17.939			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.216		.335	U	43.519			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2017-1633 **Client ID:** CAWA-17-133278L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424596001 **Serial Dilution ID:** 1203810091

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

## \*Analytical Methods:

AV EPA 245.1/245.2



# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1670679

**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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203803827	Method Blank (MB)
1203803828	Laboratory Control Sample (LCS)
1203803830	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203803832	424596007(CAWA-17-134191) 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 424596007 (CAWA-17-134191) 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****Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1670760	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1670759	<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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203803257	Method Blank (MB)
1203803258	Laboratory Control Sample (LCS)
1203803259	424596001(CAWA-17-133278) Sample Duplicate (DUP)
1203803262	424596001(CAWA-17-133278) 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# 19.

### **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 424596001 (CAWA-17-133278) was 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 Preservation/Integrity**

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

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

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

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

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



### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1670735

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203803175	Method Blank (MB)
1203803176	Laboratory Control Sample (LCS)
1203803177	424596010(CAWA-17-133316) Sample Duplicate (DUP)
1203803178	424596010(CAWA-17-133316) 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-1600 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 424596010 (CAWA-17-133316) was 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 following samples 1203803177 (CAWA-17-133316DUP), 1203803178 (CAWA-17-133316PS), 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334) and 424596010 (CAWA-17-133316) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	424596		
	002	003	010
Chloride	5X	5X	10X

**Sample Re-analysis**

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

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

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

**Manual Integrations**

Samples 1203803177 (CAWA-17-133316DUP), 1203803178 (CAWA-17-133316PS), 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191) and 424596010 (CAWA-17-133316) 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:** 1670372 **Method:** NH3  
**Prep Batch :** 1670371 **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203802234	Method Blank (MB)
1203802235	Laboratory Control Sample (LCS)
1203803278	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203803279	424596002(CAWA-17-133306) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 424596002 (CAWA-17-133306) was 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1670378	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1670377	<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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203802248	Method Blank (MB)
1203802249	Laboratory Control Sample (LCS)
1203803289	424596001(CAWA-17-133278) Sample Duplicate (DUP)
1203803290	424596001(CAWA-17-133278) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

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

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

### **Calibration Information**

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

### **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 424596001 (CAWA-17-133278) 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, Total Kjeldahl	1203803290 (CAWA-17-133278MS)	79* (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 424596001 (CAWA-17-133278) and 424596007 (CAWA-17-134191) were re-analyzed due to instrument



failure. The results from the reanalysis are reported.

### **Miscellaneous Information**

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

A data exception report (DER) 1640084 was generated for sample 1203803290 (CAWA-17-133278MS) in this SDG/batch.

#### **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:** 1670096

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203801609	Method Blank (MB)
1203801610	Laboratory Control Sample (LCS)
1203801611	424151005(CASA-17-132988) Sample Duplicate (DUP)
1203801613	424151005(CASA-17-132988) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **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 424151005 (CASA-17-132988) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1670383	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1670381	<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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203802258	Method Blank (MB)
1203802259	Laboratory Control Sample (LCS)
1203803294	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203803295	424596002(CAWA-17-133306) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **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 424596002 (CAWA-17-133306) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1671087

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203804101	Method Blank (MB)
1203804102	Laboratory Control Sample (LCS)
1203804103	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203804104	424596003(CAWA-17-133334) 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**

Samples 424596002 (CAWA-17-133306) and 424596003 (CAWA-17-133334) were 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	1203804103 (CAWA-17-133306DUP)	10.1* (0%-5%)
	1203804104 (CAWA-17-133334DUP)	17.1* (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****Data Exception (DER) Documentation**

A data exception report (DER) 1640653 was generated for samples 1203804103 (CAWA-17-133306DUP) and 1203804104 (CAWA-17-133334DUP) in this SDG/batch.

**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:** 1671823

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Initial Standardization**

The titrant was properly standardized

#### **Calibration Verification Information**

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

### **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 424596002 (CAWA-17-133306) and 424747001 (CAWA-17-133332) were selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1671988 **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424596002 (CAWA-17-133306) was selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596002 (CAWA-17-133306)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596003 (CAWA-17-133334)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596007 (CAWA-17-134191)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596010 (CAWA-17-133316)	pH	Received 02-JUN-17, out of holding 31-MAY-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****Data Exception (DER) Documentation**

A data exception report (DER) 1640886 was generated for samples 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191), 424596010 (CAWA-17-133316) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

**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:

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scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1671987      **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

The Titration and Ion analysis was performed on a Electronic bottle-top buret.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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



The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424747001 (CAWA-17-133332) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596


#### **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:** 22 JUN 2017

**Title:** Analyst I

# Sample Data Summary

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133278  
Sample ID: 424596001  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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		1.98	0.330	1.00	mg/L		1	TSM	06/10/17	0124	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0842	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1446	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133306  
Sample ID: 424596002  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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	MXL2	06/03/17	0917	1670735	1
Fluoride	J	0.0812	0.033	0.100	mg/L		1					
Sulfate		7.60	0.133	0.400	mg/L		1					
Chloride		21.1	0.335	1.00	mg/L		5	MXL2	06/05/17	1633	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0929	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0950	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.673	0.017	0.050	mg/L		1	AXH3	06/05/17	0856	1670096	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.039	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1137	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		149	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		46.2	1.45	4.00	mg/L			RXB5	06/09/17	1323	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		236	1.00	1.00	umhos/cm		1	VH1	06/08/17	1057	1671823	8
PH "As Received"												
pH at Temp 10.9C	H	7.26	0.010	0.100	SU		1	RXB5	06/09/17	1321	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133306  
Sample ID: 424596002

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133334  
Sample ID: 424596003  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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	MXL2	06/03/17	0946	1670735	1
Fluoride	J	0.0887	0.033	0.100	mg/L		1					
Sulfate		7.60	0.133	0.400	mg/L		1					
Chloride		20.7	0.335	1.00	mg/L		5	MXL2	06/05/17	1702	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.104	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0952	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.675	0.017	0.050	mg/L		1	AXH3	06/05/17	0857	1670096	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.0476	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1139	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		107	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		46.4	1.45	4.00	mg/L			RXB5	06/09/17	1328	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		228	1.00	1.00	umhos/cm		1	VH1	06/08/17	1058	1671823	8
PH "As Received"												
pH at Temp 11.8C	H	7.26	0.010	0.100	SU		1	RXB5	06/09/17	1327	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133334  
Sample ID: 424596003

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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



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## Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133336  
Sample ID: 424596004  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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		1.79	0.330	1.00	mg/L		1	TSM	06/10/17	0211	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0845	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1444	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007  
Matrix: W  
Collect Date: 31-MAY-17 08:54  
Receive Date: 02-JUN-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	U	ND	0.330	1.00	mg/L		1	TSM	06/10/17	0322	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0846	1670760	2
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/03/17	1015	1670735	3
Chloride	J	0.0894	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.060	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0953	1670372	4
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	06/05/17	0858	1670096	5
PO4 "As Received"												
Phosphorus, Total as P	J	0.0319	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1146	1670383	6
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1458	1670378	7
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids	U	ND	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	8
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3	U	ND	1.45	4.00	mg/L			RXB5	06/09/17	1330	1671987	9
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		1.67	1.00	1.00	umhos/cm		1	VH1	06/08/17	1058	1671823	10
PH "As Received"												
pH at Temp 9.60C	H	5.70	0.010	0.100	SU		1	RXB5	06/09/17	1329	1671988	11

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
EPA 335.4	EPA 335.4	Total Cyanide		AXH3	06/07/17		0710		1670759			
EPA 350.1 Prep	EPA 350.1	Ammonia Nitrogen Prep		KLP1	06/08/17		1545		1670371			
EPA 351.2 Prep	EPA 351.2	Total Kjeldahl Nitrogen Prep		KLP1	06/06/17		1700		1670377			
EPA 365.4 Prep	EPA 365.4	Phosphorus, Total in liquid PR		KLP1	06/06/17		1700		1670381			

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW-846:9060	
2	EPA 335.4 1993	
3	EPA:300.0	
4	EPA:350.1	
5	EPA:353.2	
6	EPA 365.4 1974	
7	EPA:351.2	
8	EPA:160.1	
9	EPA:310.1	
10	EPA:120.1	
11	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: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133288  
Sample ID: 424596009  
Matrix: W  
Collect Date: 31-MAY-17 12:25  
Receive Date: 02-JUN-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		1.63	0.330	1.00	mg/L		1	TSM	06/10/17	0543	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0847	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1445	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133316  
Sample ID: 424596010  
Matrix: W  
Collect Date: 31-MAY-17 12:25  
Receive Date: 02-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.198	0.067	0.200	mg/L		1	MXL2	06/03/17	1044	1670735	1
Fluoride		0.116	0.033	0.100	mg/L		1					
Sulfate		8.83	0.133	0.400	mg/L		1					
Chloride		66.5	0.670	2.00	mg/L		10	MXL2	06/05/17	1731	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0941	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0954	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.05	0.017	0.050	mg/L		1	AXH3	06/05/17	0900	1670096	4
PO4 "As Received"												
Phosphorus, Total as P		0.0585	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1147	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		120	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		61.4	1.45	4.00	mg/L			RXB5	06/09/17	1333	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		190	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 9.30C	H	7.38	0.010	0.100	SU		1	RXB5	06/09/17	1331	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133316  
Sample ID: 424596010

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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: June 22, 2017

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

Contact: Mr. Keith Greene

Workorder: 424596

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1670679										
QC1203803830	424596007	DUP									
Total Organic Carbon Average		U	ND	U	ND	mg/L	N/A		TSM	06/10/17	04:09
QC1203803828	LCS										
Total Organic Carbon Average	10.0				10.4	mg/L	104	(80%-120%)		06/09/17	17:24
QC1203803827	MB										
Total Organic Carbon Average			U	ND	mg/L					06/09/17	17:12
QC1203803832	424596007	PS									
Total Organic Carbon Average	10.0	U	ND		10.7	mg/L	106	(75%-125%)		06/10/17	04:56
<b>Flow Injection Analysis</b>											
Batch	1670760										
QC1203803259	424596001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/07/17	08:43
QC1203803258	LCS										
Cyanide, Total	50.0				50.9	ug/L	102	(90%-110%)		06/07/17	08:28
QC1203803257	MB										
Cyanide, Total			U	ND	ug/L					06/07/17	08:27
QC1203803262	424596001	MS									
Cyanide, Total	100	U	ND		107	ug/L	107	(90%-110%)		06/07/17	08:44
<b>Ion Chromatography</b>											
Batch	1670735										
QC1203803177	424596010	DUP									
Bromide		J	0.198	J	0.198	mg/L	0.0505	^	(+/-0.200)	MXL2	06/03/17 11:13



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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1670735										
Chloride		66.5		66.6	mg/L	0.113		(0%-20%)	MXL2	06/05/17	18:00
Fluoride		0.116		0.118	mg/L	1.79	^	(+/-0.100)		06/03/17	11:13
Sulfate		8.83		8.81	mg/L	0.315		(0%-20%)			
QC1203803176 LCS											
Bromide	1.25			1.27	mg/L		102	(80%-120%)		06/03/17	08:20
Chloride	5.00			4.77	mg/L		95.4	(80%-120%)			
Fluoride	2.50			2.46	mg/L		98.6	(80%-120%)			
Sulfate	10.0			10.0	mg/L		100	(80%-120%)			
QC1203803175 MB											
Bromide			U	ND	mg/L					06/03/17	07:51
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203803178 424596010 PS											
Bromide	1.25	J	0.198	1.43	mg/L		98.5	(75%-125%)		06/03/17	11:42
Chloride	5.00		6.65	12.1	mg/L		109	(75%-125%)		06/05/17	18:29
Fluoride	2.50		0.116	2.52	mg/L		96.2	(75%-125%)		06/03/17	11:42
Sulfate	10.0		8.83	19.3	mg/L		105	(75%-125%)			

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1670096										
QC1203801611	424151005	DUP									
Nitrogen, Nitrate/Nitrite		U	ND	U	ND	mg/L	N/A		AXH3	06/05/17	08:40
QC1203801610	LCS										
Nitrogen, Nitrate/Nitrite	1.00				0.994	mg/L	99.4	(90%-110%)		06/05/17	08:37
QC1203801609	MB										
Nitrogen, Nitrate/Nitrite			U		ND	mg/L				06/05/17	08:36
QC1203801613	424151005	PS									
Nitrogen, Nitrate/Nitrite	1.00	U	ND		1.00	mg/L	100	(90%-110%)		06/05/17	08:41
Batch	1670372										
QC1203803278	424596002	DUP									
Nitrogen, Ammonia			0.0929		0.074	mg/L	22.6 ^	(+/-0.050)	KLP1	06/09/17	09:50
QC1203802235	LCS										
Nitrogen, Ammonia	1.00				1.00	mg/L	100	(90%-110%)		06/09/17	09:28
QC1203802234	MB										
Nitrogen, Ammonia			J		0.0406	mg/L				06/09/17	09:27
QC1203803279	424596002	MS									
Nitrogen, Ammonia	1.00		0.0929		1.00	mg/L	90.7	(90%-110%)		06/09/17	09:51
Batch	1670378										
QC1203803289	424596001	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	06/07/17	14:42
QC1203802249	LCS										
Nitrogen, Total Kjeldahl	1.00				0.994	mg/L	99.4	(90%-110%)		06/07/17	14:29
QC1203802248	MB										
Nitrogen, Total Kjeldahl			U		ND	mg/L				06/07/17	14:28

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1670378										
QC1203803290	424596001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.807	mg/L		79 *	(90%-110%)	KLP1	06/07/17	14:43
<hr/>											
Batch	1670383										
QC1203803294	424596002	DUP									
Phosphorus, Total as P		J	0.039	J	0.0444	mg/L	12.9 ^	(+/-0.050)	KLP1	06/07/17	11:38
<hr/>											
QC1203802259	LCS										
Phosphorus, Total as P	1.00				1.03	mg/L		103	(80%-124%)		06/07/17 11:25
<hr/>											
QC1203802258	MB										
Phosphorus, Total as P			J	0.0271	mg/L						06/07/17 11:24
<hr/>											
QC1203803295	424596002	MS									
Phosphorus, Total as P	1.00	J	0.039	1.01	mg/L		97.1	(63%-139%)			06/07/17 11:38
<hr/>											
<b>Solids Analysis</b>											
Batch	1671087										
QC1203804103	424596002	DUP									
Total Dissolved Solids			149		134	mg/L	10.1 *	(0%-5%)	KLP1	06/07/17	15:37
<hr/>											
QC1203804104	424596003	DUP									
Total Dissolved Solids			107		127	mg/L	17.1 *	(0%-5%)			06/07/17 15:37
<hr/>											
QC1203804102	LCS										
Total Dissolved Solids	300				287	mg/L		95.7	(95%-105%)		06/07/17 15:37
<hr/>											
QC1203804101	MB										
Total Dissolved Solids			U	ND	mg/L						06/07/17 15:37
<hr/>											
<b>Titration and Ion Analysis</b>											
Batch	1671823										
QC1203805835	424596002	DUP									
Conductivity			236		233	umhos/cm	1.28	(0%-10%)	VH1	06/08/17	10:57

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1671823										
QC1203805836	424747001	DUP									
Conductivity		157		156	umhos/cm	0.639		(0%-10%)	VH1	06/08/17	11:04
QC1203805834	LCS										
Conductivity	1410			1400	umhos/cm		99.2	(95%-105%)		06/08/17	10:45
Batch	1671987										
QC1203806285	424747001	DUP									
Alkalinity, Total as CaCO3		58.6		59.0	mg/L	0.68		(0%-20%)	RXB5	06/09/17	13:58
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203806283	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		06/09/17	13:09
QC1203806287	424747001	MS									
Alkalinity, Total as CaCO3	100	58.6		165	mg/L		107	(80%-120%)		06/09/17	13:59
Batch	1671988										
QC1203806296	424596002	DUP									
pH		H	7.26	H	7.27	SU	0.138	(0%-5%)	RXB5	06/09/17	13:23
QC1203806295	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		06/09/17	13:08

### 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

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
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.

# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 07-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 351.2, EPA 351.2 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> CCUV, ESHL, INEL, SPOA
<b>Batch ID:</b> 1670378	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424482,424561,424596(2017-1633)</b> <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203802251MS, 1203803290MS		1. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Total Kjeldahl 1203802251 (WRP153013AMS) [85.1* (90%-110%)] and 1203803290 (CAWA-17-133278MS) [79* (90%-110%)].	

**Originator's Name:**  
Kristen Mizzell 07-JUN-17

**Data Validator/Group Leader:**  
Aubrey Kingsbury 09-JUN-17

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 09-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE ANALYTICAL	<b>Test / Method:</b> EPA 160.1, SM 2540C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BELI, ESHL
<b>Batch ID:</b> 1671087	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633),424616</b> <b>Application Issues:</b> Sample received out of holding Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP: QC 1203804103DUP,1203804104DUP 2. Sample received out of holding: 424616 001,004,005,006,007,010		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203804103 (CAWA-17-133306DUP) [10.1* (0%-5%)] and 1203804104 (CAWA-17-133334DUP) [17.1* (0%-5%)]. 2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 424616001 (1. Butterworth - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616004 (4. Blodgett - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616005 (5. Blodgett - RO Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616006 (6. Blodgett - Hot Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616007 (7. South Pavilion - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616010 (10. Madera Community - Washer Water) [Received 01-JUN-17, out of holding 31-MAY-17].	

**Originator's Name:**

Kristen Mizzell 09-JUN-17

**Data Validator/Group Leader:**

Aubrey Kingsbury 09-JUN-17



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 10-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GELC
<b>Batch ID:</b> 1671988	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 424296,424297,424596(2017-1633),424735(2017-1647),424739(2017-1645),424741(2017-1644),424747(2017-1649) <b>Application Issues:</b> Sample received out of holding Sample Logged out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Logged out of Holding: 424296 001  2. Sample received out of holding: 424297 001 424596 002,003,007,010 424735 002,004 424739 001 424741 001,003,006,008,009 424747 001 QC 1203806296DUP,1203806297DUP		1. Sample (See Below) was logged in for this analysis outside of the method specified holding time. The data is qualified. 424296001 (Rad Pyridine 7647) [Logged 30-MAY-17, out of holding 30-MAY-17].  2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203806296 (CAWA-17-133306DUP) [Received 02-JUN-17, out of holding 31-MAY-17]. 1203806297 (CAWA-17-13332DUP) [Received 06-JUN-17, out of holding 02-JUN-17]. 424297001 (Non-Rad Pyridine 7856) [Received 30-MAY-17, out of holding 30-MAY-17]. 424596002 (CAWA-17-133306) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596003 (CAWA-17-133334) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596007 (CAWA-17-134191) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596010 (CAWA-17-133316) [Received 02-JUN-17, out of holding 31-MAY-17]. 424735002 (CAWA-17-134176) [Received 06-JUN-17, out of holding 02-JUN-17]. 424735004 (CAWA-17-133309) [Received 06-JUN-17, out of holding 02-JUN-17]. 424739001 (CAPA-17133354) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741001 (CAPA-17-133353) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741003 (CAPA-17-133360) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741006 (CAWA-17-133318) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741008 (CAPA-17-133358) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741009 (CAPA-17-133359) [Received 06-JUN-17, out of holding 01-JUN-17]. 424747001 (CAWA-17-133332) [Received 06-JUN-17, out of holding 02-JUN-17].	

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

# **Radiological Analysis**

# Case Narrative

**Radiochemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1670707

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203803116	Method Blank (MB)
1203803118	Laboratory Control Sample (LCS)
1203803117	424596007(CAWA-17-134191) 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 June 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 1203803116 (MB) and 1203803118 (LCS) were changed to 1.0 per client request.

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank result is less than 1.65 times the CSU.

**Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

**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 prep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

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

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:**

**ISOPU**

Analytical Method:

HASL-300:ISOPU

Analytical Batch Number: 1670709

Sample ID	Client ID
424596007	CAWA-17-134191
1203803122	Method Blank (MB)
1203803124	Laboratory Control Sample (LCS)
1203803123	424596007(CAWA-17-134191) 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 June 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 1203803122 (MB) and 1203803124 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank 1203803122 (MB) result for Pu-239/240 is greater than 1.65 times the CSU but less than the MDC.

##### **Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

##### **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.

### **Miscellaneous Information:**

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

A data exception report (DER) 1644801 was generated for sample 424596007 (CAWA-17-134191) in this SDG/batch. DER 1644801 was generated due to Other. 1. Sample 424596007 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

#### **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**

The MDCs (and Lc if requested) are calculated using a blank population.

#### **Blank Decision Level**

The blank 1203803122 (MB) result for Pu-239/240 is greater than the decision level but less than the MDC.

### **Qualifier Information**

Manual qualifiers were not required.

### **Method/Analysis Information**

<b>Product:</b>	<b>IsoU</b>
Analytical Method:	HASL-300:ISOU
Analytical Batch Number:	1670711

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203803125	Method Blank (MB)
1203803127	Laboratory Control Sample (LCS)
1203803126	424596007(CAWA-17-134191) 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 June 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 1203803125 (MB) and 1203803127 (LCS) were changed to 1.0 per client request.

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank 1203803125 (MB) results for U-233/234 and U-238 are greater than 1.65 times the CSU but less than the MDC.

**Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

**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**

Samples were recounted due to a suspected blank false positive. The recounts are reported.

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

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank 1203803125 (MB) result for U-233/234 is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:**                      **GammaSpec**

Analytical Method:              EPA:901.1

Analytical Batch Number:      1673943

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203811244	Method Blank (MB)
1203811246	Laboratory Control Sample (LCS)
1203811245	424596007(CAWA-17-134191) 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 2016, May 2017 and September 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**

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

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank, 1203811244 (MB), result for Co-60 is greater than 1.65 times the CSU but less than the MDC.

**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.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1671753

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203805583	Method Blank (MB)
1203805586	Laboratory Control Sample (LCS)
1203805584	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805585	424596007(CAWA-17-134191) 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-RAD-A-004 REV# 18.

#### **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 1203805583 (MB) and 1203805586 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank result is less than 1.65 times the CSU.

**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.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**

Sample 1203805583 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Sample 1203805584 (CAWA-17-134191DUP) was recounted due to a suspected false positive. The recount is reported.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** WSP-GrossA/B

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1671754

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203805587	Method Blank (MB)
1203805591	Laboratory Control Sample (LCS)
1203805588	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805589	424596007(CAWA-17-134191) 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-RAD-A-001 REV# 19.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 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 1203805587 (MB) and 1203805591 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **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.

##### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

##### **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**

Sample 1203805591 (LCS) was recounted due to high recovery. The recount is reported.

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

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

**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, 1203805589 (CAWA-17-134191MS) and 1203805590 (CAWA-17-134191MSD), aliquots were reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

**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.

## **GEL LABORATORIES LLC**

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### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596


#### **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:** Theresa Austin

**Date:** 26 JUN 2017

**Title:** Group Leader



DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 22-JUN-17	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ALPHA SPECTROMETER	<b>Test / Method:</b> DOE EML HASL-300, Pu-11-RC Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1670709	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633)</b> <b>Application Issues:</b> Other			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Sample 424596007 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.		1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.	

**Originator's Name:**  
Jennifer Griesbach      22-JUN-17

**Data Validator/Group Leader:**  
Jessica Davis              26-JUN-17

# Sample Data Summary

# GEL LABORATORIES LLC

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Report Date: June 26, 2017

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007  
Matrix: W  
Collect Date: 31-MAY-17  
Receive Date: 02-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*Alphaspec Am241 Liquid "As Received"*

Americium-241	U	-0.00775	+/-0.00671	0.0323	0.0135	+/-0.00671	0.050	pCi/L			HAKB	06/21/17	1426	1670707	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0217	+/-0.0106	0.0371	0.0156	+/-0.0107	0.050	pCi/L			HAKB	06/21/17	1426	1670709	2
Plutonium-239/240	U	0.0217	+/-0.0141	0.0394	0.0167	+/-0.0141	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234	U	0.0184	+/-0.0103	0.0785	0.0343	+/-0.0103	1.00	pCi/L			HAKB	06/24/17	1905	1670711	3
Uranium-235/236	U	0.0318	+/-0.0131	0.0769	0.0323	+/-0.0132	1.00	pCi/L							
Uranium-238	U	0.0184	+/-0.0103	0.0812	0.0356	+/-0.0103	0.500	pCi/L							

### Rad Gamma Spec Analysis

*Gammasespec "As Received"*

Cesium-137	U	-0.436	+/-1.25	4.44	1.92	+/-1.26	8.00	pCi/L			MJH1	06/20/17	0706	1673943	4
Cobalt-60	U	0.846	+/-1.18	5.08	2.12	+/-1.19	8.00	pCi/L							
Neptunium-237	U	-1.16	+/-2.41	8.47	3.85	+/-2.43		pCi/L							
Potassium-40	U	-21.5	+/-13.9	51.9	21.8	+/-14.7		pCi/L							
Sodium-22	U	2.87	+/-1.39	6.34	2.76	+/-1.54		pCi/L							

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

Strontium-90	U	0.126	+/-0.0615	0.201	0.096	+/-0.0624	0.500	pCi/L			KSD1	06/10/17	1148	1671753	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.035	+/-0.788	2.87	1.29	+/-0.788	3.00	pCi/L			LXB3	06/09/17	1159	1671754	6
Alpha	U	-0.172	+/-0.325	1.43	0.574	+/-0.325	3.00	pCi/L			LXB3	06/12/17	1241	1671754	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"	1670707	96.2	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1670709	87.2	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1670711	99.5	(50%-105%)

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## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: June 26, 2017

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-134191

Sample ID: 424596007

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"							1671753	78.7	(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

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: June 26, 2017

Page 1 of 6

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

Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 424596

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1670707										
QC1203803117	424596007	DUP									
Americium-241	U	-0.00775	U	0.0159	pCi/L	0.902		(0-1)	HAKB	06/21/17	14:26
	Uncert:	+/-0.00671		+/-0.00639							
	TPU:	+/-0.00671		+/-0.00642							
**Americium-243 Tracer	2.62	2.52		2.55	pCi/L		97.2	(50%-105%)			
	Uncert:	+/-0.0711		+/-0.0679							
	TPU:	+/-0.134		+/-0.130							
QC1203803118	LCS										
Americium-241	1.97			1.74	pCi/L		88.7	(80%-120%)	HAKB	06/21/17	14:26
	Uncert:			+/-0.0501							
	TPU:			+/-0.0894							
**Americium-243 Tracer	2.10			2.08	pCi/L		99.1	(50%-105%)			
	Uncert:			+/-0.0545							
	TPU:			+/-0.104							
QC1203803116	MB										
Americium-241			U	0.00599	pCi/L				HAKB	06/21/17	14:26
	Uncert:			+/-0.00529							
	TPU:			+/-0.00529							
**Americium-243 Tracer	2.10			1.67	pCi/L		79.8	(50%-105%)			
	Uncert:			+/-0.0645							
	TPU:			+/-0.115							
Batch	1670709										
QC1203803123	424596007	DUP									
Plutonium-238	U	0.0217	U	8.13E-10	pCi/L	0.652		(0-1)	HAKB	06/21/17	14:26
	Uncert:	+/-0.0106		+/-0.00598							
	TPU:	+/-0.0107		+/-0.00598							
Plutonium-239/240	U	0.0217	U	-0.00732	pCi/L	0.634		(0-1)			
	Uncert:	+/-0.0141		+/-0.00879							
	TPU:	+/-0.0141		+/-0.00879							
**Plutonium-242 Tracer	2.46	2.15		1.67	pCi/L		68	(50%-105%)			
	Uncert:	+/-0.0752		+/-0.078							
	TPU:	+/-0.127		+/-0.130							
QC1203803124	LCS										
Plutonium-238			U	0.0151	pCi/L			(80%-120%)	HAKB	06/21/17	14:26
	Uncert:			+/-0.008							
	TPU:			+/-0.00802							
Plutonium-239/240	1.98			2.00	pCi/L		101	(80%-120%)			
	Uncert:			+/-0.0617							
	TPU:			+/-0.104							
**Plutonium-242 Tracer	1.97			1.57	pCi/L		79.9	(50%-105%)			
	Uncert:			+/-0.0613							
	TPU:			+/-0.103							

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1670709										
QC1203803122	MB										
Plutonium-238			U	-0.0047	pCi/L				HAKB	06/21/17	14:26
				Uncert: +/-0.00415							
				TPU: +/-0.00415							
Plutonium-239/240			U	0.0204	pCi/L						
				Uncert: +/-0.00683							
				TPU: +/-0.00688							
**Plutonium-242 Tracer	1.97			1.72	pCi/L		87.3	(50%-105%)			
				Uncert: +/-0.0558							
				TPU: +/-0.0964							
Batch	1670711										
QC1203803126	424596007	DUP									
Uranium-234		U	0.0184	U	0.0238	pCi/L	0.0962	(0-1)	HAKB	06/24/17	19:05
				Uncert: +/-0.0103							
				TPU: +/-0.0103							
Uranium-235/236		U	0.0318	U	0.00319	pCi/L	0.543	(0-1)			
				Uncert: +/-0.0131							
				TPU: +/-0.0132							
Uranium-238		U	0.0184	U	0.00779	pCi/L	0.208	(0-1)			
				Uncert: +/-0.0103							
				TPU: +/-0.0103							
**Uranium-232 Tracer	2.61	2.60		1.84	pCi/L		70.7	(50%-105%)			
				Uncert: +/-0.0984							
				TPU: +/-0.170							
QC1203803127	LCS										
Uranium-234				2.79	pCi/L				HAKB	06/24/17	19:05
				Uncert: +/-0.0982							
				TPU: +/-0.183							
Uranium-235/236				0.162	pCi/L						
				Uncert: +/-0.0267							
				TPU: +/-0.0282							
Uranium-238	2.70			2.98	pCi/L		110	(80%-120%)			
				Uncert: +/-0.102							
				TPU: +/-0.194							
**Uranium-232 Tracer	2.09			1.74	pCi/L		83.6	(50%-105%)			
				Uncert: +/-0.0853							
				TPU: +/-0.143							
QC1203803125	MB										
Uranium-234			U	0.0691	pCi/L				HAKB	06/24/17	19:05
				Uncert: +/-0.0168							
				TPU: +/-0.0173							
Uranium-235/236			U	0.0118	pCi/L						
				Uncert: +/-0.0101							
				TPU: +/-0.0101							
Uranium-238			U	0.0191	pCi/L						
				Uncert: +/-0.0107							
				TPU: +/-0.0107							

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1670711										
**Uranium-232 Tracer											
	2.09			1.68	pCi/L		80.7	(50%-105%)			
	Uncert:			+/-0.090							
	TPU:			+/-0.149							
<b>Rad Gamma Spec</b>											
Batch	1673943										
QC1203811245 424596007 DUP											
Cesium-137	U	-0.436	U	-1.4	pCi/L	0.175		(0-1)	MJH1	06/20/17	09:12
	Uncert:	+/-1.25		+/-1.46							
	TPU:	+/-1.26		+/-1.50							
Cobalt-60	U	0.846	U	1.40	pCi/L	0.103		(0-1)			
	Uncert:	+/-1.18		+/-1.47							
	TPU:	+/-1.19		+/-1.50							
Neptunium-237	U	-1.16	U	-0.827	pCi/L	0.0352		(0-1)			
	Uncert:	+/-2.41		+/-2.33							
	TPU:	+/-2.43		+/-2.34							
Potassium-40	U	-21.5	U	-37.4	pCi/L	0.226		(0-1)			
	Uncert:	+/-13.9		+/-18.6							
	TPU:	+/-14.7		+/-20.6							
Sodium-22	U	2.87	U	-0.526	pCi/L	0.604		(0-1)			
	Uncert:	+/-1.39		+/-1.27							
	TPU:	+/-1.54		+/-1.27							
QC1203811246 LCS											
Americium-241	34300			36900	pCi/L		108	(80%-120%)	MJH1	06/20/17	08:51
	Uncert:			+/-461							
	TPU:			+/-1470							
Cesium-137	13100			14200	pCi/L		108	(80%-120%)			
	Uncert:			+/-165							
	TPU:			+/-353							
Cobalt-60	11900			11900	pCi/L		100	(80%-120%)			
	Uncert:			+/-166							
	TPU:			+/-279							
Neptunium-237			U	22.0	pCi/L						
	Uncert:			+/-51.8							
	TPU:			+/-52.0							
Potassium-40			U	-6.16	pCi/L						
	Uncert:			+/-120							
	TPU:			+/-120							
Sodium-22			U	3.12	pCi/L						
	Uncert:			+/-15.0							
	TPU:			+/-15.0							
QC1203811244 MB											
Cesium-137			U	-0.404	pCi/L				MJH1	06/20/17	07:16
	Uncert:			+/-1.20							
	TPU:			+/-1.20							
Cobalt-60			U	2.21	pCi/L						
	Uncert:			+/-1.09							



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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	1673943										
Neptunium-237	TPU:			+/-1.21							
			U	1.32	pCi/L						
	Uncert:			+/-2.04							
Potassium-40	TPU:			+/-2.06							
			U	-39.9	pCi/L						
	Uncert:			+/-15.8							
Sodium-22	TPU:			+/-18.5							
			U	-1.07	pCi/L						
	Uncert:			+/-1.04							
	TPU:			+/-1.07							
<b>Rad Gas Flow</b>											
Batch	1671753										
QC1203805584	424596007	DUP									
Strontium-90	U	0.126	U	0.361	pCi/L	0.564		(0-1)	KSD1	06/12/17	12:27
	Uncert:	+/-0.0615		+/-0.143							
	TPU:	+/-0.0624		+/-0.146							
**Strontium Carrier	7.75	6.10		6.50	mg		83.9	(50%-105%)			
QC1203805586	LCS										
Strontium-90	21.9			24.5	pCi/L		112	(80%-120%)	KSD1	06/12/17	09:09
	Uncert:			+/-0.615							
	TPU:			+/-2.10							
**Strontium Carrier	7.75			5.30	mg		68.4	(50%-105%)			
QC1203805583	MB										
Strontium-90			U	0.101	pCi/L				KSD1	06/12/17	14:18
	Uncert:			+/-0.0861							
	TPU:			+/-0.0864							
**Strontium Carrier	7.75			7.10	mg		91.6	(50%-105%)			
QC1203805585	424596007	MS									
Strontium-90	438	U	0.126	428	pCi/L		97.8	(75%-125%)	KSD1	06/12/17	09:09
	Uncert:		+/-0.0615	+/-9.65							
	TPU:		+/-0.0624	+/-35.8							
**Strontium Carrier	7.75	6.10		7.50	mg		96.8	(50%-105%)			
Batch	1671754										
QC1203805588	424596007	DUP									
Alpha	U	-0.172	U	0.311	pCi/L	0.385		(0-1)	LXB3	06/12/17	12:41
	Uncert:	+/-0.325		+/-0.300							
	TPU:	+/-0.325		+/-0.302							
Beta	U	0.035	U	0.295	pCi/L	0.0822		(0-1)		06/09/17	11:59
	Uncert:	+/-0.788		+/-0.795							
	TPU:	+/-0.788		+/-0.795							
QC1203805591	LCS										
Alpha	12.1			11.1	pCi/L		91.8	(80%-120%)	LXB3	06/13/17	07:42
	Uncert:			+/-0.582							
	TPU:			+/-1.17							
Beta	43.8			47.8	pCi/L		109	(80%-120%)		06/09/17	11:59

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424596

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time	
Rad Gas Flow												
Batch	1671754											
				Uncert:								
				TPU:								
QC1203805587	MB											
Alpha			U	0.102	pCi/L				LXB3	06/12/17	12:41	
				Uncert:								
				TPU:								
Beta			U	-0.00971	pCi/L					06/09/17	11:59	
				Uncert:								
				TPU:								
QC1203805589	424596007	MS										
Alpha		242	U	-0.172	251	pCi/L		104	(75%-125%)	LXB3	06/12/17	12:42
				Uncert:								
				TPU:								
Beta		875	U	0.035	1050	pCi/L		120	(75%-125%)		06/09/17	11:59
				Uncert:								
				TPU:								
QC1203805590	424596007	MSD										
Alpha		242	U	-0.172	237	pCi/L	0.153	97.9	(0-1)	LXB3	06/12/17	12:42
				Uncert:								
				TPU:								
Beta		875	U	0.035	973	pCi/L	0.22	111	(0-1)		06/09/17	11:59
				Uncert:								
				TPU:								

### 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	REMP 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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## QC Summary

Workorder: 424596

Page 6 of 6

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.

July 19, 2017

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

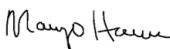
Re: LANL- WQH Water Samples  
Work Order: 424596  
SDG: 2017-1633

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 02, 2017, and analyzed for Explosives by LCMSMS, GC Semivolatile PCB, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package has been revised to include the results for HMX, DNX, and TNX on the HE Form 1s.

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,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1633  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 424596**  
**SDG: 2017-1633**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 424596  
SDG # : 2017-1633**

**July 19, 2017**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 02, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. 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>
424596001	CAWA-17-133278
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596004	CAWA-17-133336
424596005	CAWA-17-134191
424596006	CAWA-17-134191
424596007	CAWA-17-134191
424596008	CAWA-17-133288
424596009	CAWA-17-133288
424596010	CAWA-17-133316
424596011	CAWA-17-133339
424596012	CAWA-17-133342

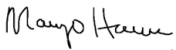
**Case Narrative**

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 Semivolatile PCB, 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.

  
Margo Herron for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 19 July 2017**

<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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**

**COC/Lab Request #:**  
2017-1633  
Page 1 of 1

Page 6 of 332



Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424596</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/2/17</u>	
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 <u>5900 1782 1570-1°C</u> <u>5900 1782 1580-3°C</u> <u>5900 1782 1569-5°C</u> <u>5900 1782 1591-4°C</u>	
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>CPM</u> mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius <span style="float: right;">TEMP: <u>Above</u></span>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" 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 checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: <u>Did not receive - 134191 WSP RAD container</u>
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<u>COC not relinquished</u>

Comments (Use Continuation Form if needed): MC

PM (or PMA) review: Initials

mett

Date

6/5/17

Page

1 of 1

GL-CHL-SR-001 Rev 5

SHIP DATE: 01JUN17  
ACTWGT: 43.0 LB MAN  
CAD: 0014176/CAFE2916

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

BILL SENDER

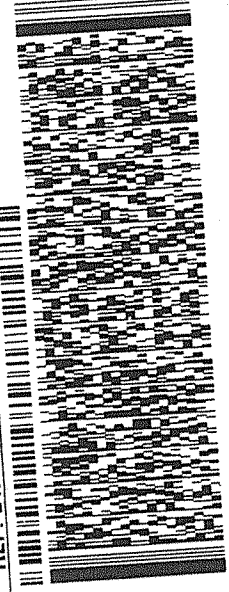
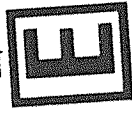
LOS ALAMOS, NM 87545  
UNITED STATES US

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

**CHARLESTON SC 29407**

(843) 566-8171  
REF: 21PD0ASRGW04BAGWEO

FedEx  
Express



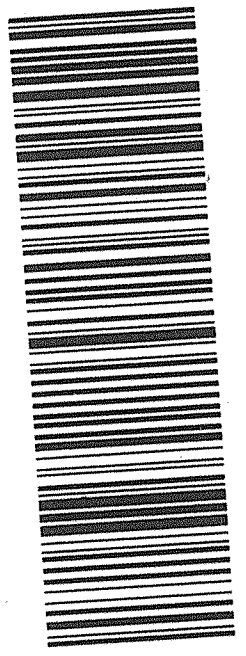
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**PRIORITY OVERNIGHT**

3 of 3  
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Mstr# 5908 1782 1569

29407  
CHS

**X7 RBWA**

SC-US



Part# 156148V-434 R1T2 06/15

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

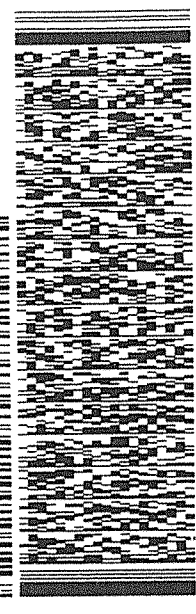
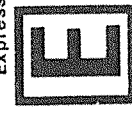
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UNITED STATES US

TO **VALERIE DAVIS**  
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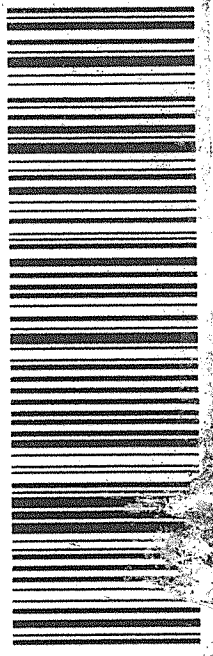
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Mstr# 5908 1782 1569

0201

29407  
CHS

**X7 RBWA**

Part# 156148V-434 R1T2 06/15





06.07

RTU

ORIGIN ID: SAFA (505) 665-9961  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TAC0 BLDG 1237 DPU 03

FZ 0

SHIP DATE: 01 JUN 17  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

LOS ALAMOS, NM 87545  
UNITED STATES US

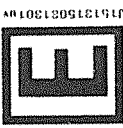
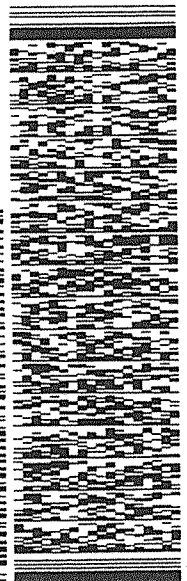
TO VALERIE DAVIS  
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2040 SAVAGE RD

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Express



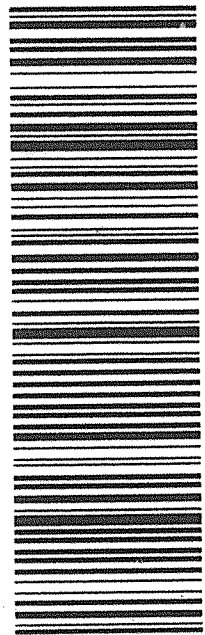
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PRIORITY OVERNIGHT

1 of 3  
TRK# 5908 1782 1569

## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15

ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TAC0 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

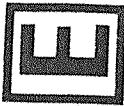
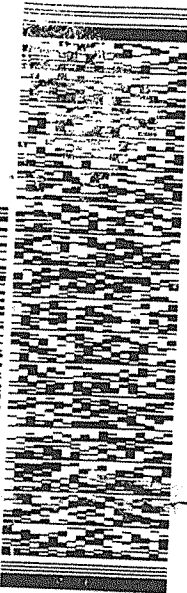
TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

4c

CHARLESTON SC 29407

(843) 556-8171  
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FedEx  
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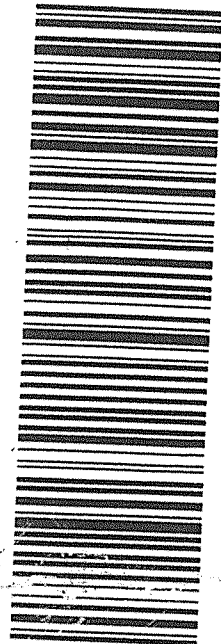


FRI - 02 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1782 1591

X7 PBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15

538C1/8734/329B

1151215081301W

**Subject:** LANL ISSUES - Missing Signature and additional VOA Vials received

**From:** Margo Herron <Margo.Herron@gel.com>

**Date:** 6/6/2017 2:57 PM

**To:** Keith Robert Greene <kgreene@lanl.gov>

**CC:** "team.davis" <team.davis@gel.com>

Good Afternoon Keith,

For request number 2017-1633, this missing container came in today for sample CAWA-17-134191. Also the chain of custody was missing the relinquished signature.

For request number 2017-1649 Sample CAWA-17-133394 we received the two SVOA bottles as the chain indicates. We also received two VOA vials for that sample ID. There is no VOA test this sample on the chain of custody. Please advise.

Thanks,

Margo Herron

--

**Margo Herron**

**Project Manager Assistant**



Laboratories LLC

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

Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178

E-Mail: [Margo.Herron@gel.com](mailto:Margo.Herron@gel.com) | Website: [www.gel.com](http://www.gel.com)

**Environmental | Engineering | Surveying | Analytical Testing**

Ask me about GEL's new testing capability for Perfluorinated chemicals (PFCs)!

<http://www.gellaboratories.com>

# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

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

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

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

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

# **Volatile Analysis**

# Case Narrative

**GC/MS Volatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch  
Number: 1671196

**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>
424596006	CAWA-17-134191
424596008	CAWA-17-133288
424596011	CAWA-17-133339
424596012	CAWA-17-133342
1203804346	424596006(CAWA-17-134191) Post Spike (PS)
1203804347	424596006(CAWA-17-134191) Post Spike (PS)
1203804348	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203804349	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203806749	Method Blank (MB)
1203806750	Laboratory Control Sample (LCS)
1203806751	Laboratory Control Sample (LCS)
1203807982	Method Blank (MB)
1203807986	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**

Target analytes were detected in the blank 1203807982 (MB) below the reporting limit.

**Surrogate Recoveries**

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

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**QC Sample Designation**

Sample 424596006 (CAWA-17-134191) was designated for spike analysis.

**Matrix Spike/Matrix Spike Duplicate Recovery Statement**

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

**Relative Percent Difference (RPD) Statement**

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

**Internal Standard (ISTD) Acceptance**

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

**Technical Information****Holding Time Specifications**

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

**Sample Preservation and Integrity**

All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**

The samples in this SDG did not require dilutions.

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

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

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

A Data exception reports (DERs) was not generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**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>
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

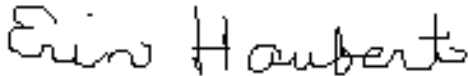
#### The Qualifiers in this report are defined as follows:

- \* 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: Erin Haubert

Date: 23 JUN 2017

Title: Data Validator

# **Sample Data Summary**

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:17	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:17		
<b>Data File:</b> 060817V4\4L409.D	<b>Column:</b> DB-624	

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

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:17	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:17		
<b>Data File:</b> 060817V4\4L409.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.24	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:17	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:17		
<b>Data File:</b> 060817V4\4L409.D	<b>Column:</b> DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.0	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	56.4	50.0	ug/L 113	(70%-131%)
Toluene-d8	50.9	50.0	ug/L 102	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	18.5	ug/L	0	J
	unknown siloxane	14.576	18.3	ug/L	0	J

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 12:25</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596008</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-133288</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 12:46</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 12:46</b>				
<b>Data File:</b>	<b>060817V4\4L410.D</b>	<b>Column:</b>	<b>DB-624</b>		

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



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 12:25</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596008</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-133288</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 12:46</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 12:46</b>				
<b>Data File:</b>	<b>060817V4\4L410.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.51	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		1.07	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	J	0.540	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 12:46	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 12:46		
<b>Data File:</b> 060817V4\4L410.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether	J	0.470	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.9	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	53.3	50.0	ug/L 107	(70%-131%)
Toluene-d8	50.4	50.0	ug/L 101	(74%-124%)

**Tentatively Identified Compound Summary**

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Data File: 060817V4\4L411.D

Column: DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Data File: 060817V4\4L411.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.71	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-133339

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:15

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:15

Column: DB-624

Data File: 060817V4\4L411.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	55.2	50.0	ug/L 110	(70%-131%)
Toluene-d8	49.0	50.0	ug/L 98	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	35.8	ug/L	0	J
	unknown siloxane	14.576	35.7	ug/L	0	J
	unknown	16.533	10.6	ug/L	0	J

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

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client ID: CAWA-17-133342

Batch ID: 1671196

Run Date: 06/08/2017 13:44

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client ID: CAWA-17-133342

Batch ID: 1671196

Run Date: 06/08/2017 13:44

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.94	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 424596012

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 13:44

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 13:44

Data File: 060817V4\4L412.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.0	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	55.0	50.0	ug/L 110	(70%-131%)
Toluene-d8	49.6	50.0	ug/L 99	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	5.79	ug/L	0	J
	unknown siloxane	14.576	8.03	ug/L	0	J



# **Quality Control Summary**

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

Page 1 of 1

**SDG Number: 2017-1633****Matrix Type: LIQUID**

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<b>Sample ID</b>	<b>Client ID</b>	<b>DCED4 %REC</b>	<b>TOL %REC</b>	<b>BFB %REC</b>
1203806750	LCS for batch 1671196	101	101	108
1203806751	LCS for batch 1671196	109	102	113
1203806749	MB for batch 1671196	106	101	111
424596006	CAWA-17-134191	104	102	113
424596008	CAWA-17-133288	104	101	107
424596011	CAWA-17-133339	107	98	110
424596012	CAWA-17-133342	104	99	110
1203804346	CAWA-17-134191PS	90	98	99
1203804348	CAWA-17-134191PSD	98	100	100
1203807986	LCS for batch 1671196	102	98	109
1203807982	MB for batch 1671196	97	98	109
1203804347	CAWA-17-134191PS	97	94	105
1203804349	CAWA-17-134191PSD	96	94	106

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**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 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	87.0	87	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	832	67	56-131
67-64-1	PS Acetone	250	0.00 U	96.3	39	25-155
74-88-4	PS Iodomethane	250	0.00 U	196	78	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	201	80	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	220	88	48-133
78-93-3	PS 2-Butanone	250	0.00 U	127	51	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	175	70	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	158	63	33-138
75-09-2	PS Methylene chloride	50.0	1.24 J	38.0	73	62-123
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	38.6	77	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.4	89	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.2	96	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.2	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.1	92	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.0	92	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	47.5	95	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	38.9	78	59-130
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	37.6	75	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	41.5	83	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.9	80	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	40.5	81	71-130
67-66-3	PS Chloroform	50.0	0.00 U	40.5	81	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	39.8	80	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	39.6	79	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	41.8	84	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	40.3	81	69-130
71-43-2	PS Benzene	50.0	0.00 U	40.0	80	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	41.0	82	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	41.5	83	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	39.8	80	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	42.2	84	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	40.3	81	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.0	82	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	42.5	85	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	39.3	79	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	39.4	79	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	40.8	82	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	37.6	75	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	40.1	80	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	41.0	82	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.8	86	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.4	89	62-131
100-42-5	PS Styrene	50.0	0.00 U	46.1	92	59-135
75-25-2	PS Bromoform	50.0	0.00 U	41.6	83	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	42.4	85	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	37.1	74	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	36.7	73	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	40.9	82	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	42.2	84	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	44.2	88	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	42.3	85	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	41.4	83	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	43.8	88	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	43.3	87	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	44.1	88	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	44.6	89	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	40.8	82	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	40.2	80	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	43.0	86	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	31.0	62	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	39.3	79	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	38.0	76	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	38.8	78	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	37.3	75	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	43.9	88	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	40.4	81	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	3980	80	60-140

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	84.4	84	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	975	78	56-131	16	0-20
67-64-1	PSD Acetone	250	0.00 U	112	45	25-155	15	0-20
74-88-4	PSD Iodomethane	250	0.00 U	198	79	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	198	79	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	239	95	48-133	8	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	148	59	25-143	15	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	201	81	61-127	14	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	178	71	33-138	12	0-20
75-09-2	PSD Methylene chloride	50.0	1.24 J	38.8	75	62-123	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	40.6	81	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	44.1	88	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	48.6	97	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	44.3	89	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	46.4	93	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	45.2	90	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.0	102	69-127	7	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	38.8	78	59-130	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	40.6	81	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	41.1	82	69-127	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.2	78	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	40.9	82	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	39.9	80	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	39.7	79	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	38.6	77	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	40.8	82	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	41.8	84	69-130	4	0-20
71-43-2	PSD Benzene	50.0	0.00 U	39.2	78	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	41.1	82	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	41.3	83	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	42.2	84	72-129	6	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	42.8	86	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	41.7	83	70-134	3	0-20
108-88-3	PSD Toluene	50.0	0.00 U	40.2	80	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	43.4	87	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	41.7	83	66-125	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	41.3	83	67-124	5	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	40.1	80	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	38.7	77	68-143	3	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	42.1	84	71-127	5	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	40.5	81	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	41.5	83	61-130	3	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	43.4	87	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	45.7	91	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	43.8	88	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	40.0	80	55-133	6	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	39.2	78	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	38.1	76	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	40.3	81	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	40.3	81	50-133	5	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	42.4	85	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	39.7	79	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	42.4	85	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	41.7	83	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	42.1	84	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	43.0	86	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	39.6	79	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	39.4	79	55-125	2	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	41.3	83	43-142	4	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	36.4	73	62-141	16	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	38.9	78	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	43.2	86	62-134	13	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	41.0	82	52-135	6	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	39.1	78	50-133	5	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	44.2	88	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	40.0	80	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4640	93	60-140	15	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1633

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804347

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:30

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS Acrolein	250	0.00 U	240	96	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	206	82	57-149
107-05-1	PS Allyl chloride	250	0.00 U	230	92	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	242	97	59-129
107-12-0	PS Propionitrile	250	0.00 U	240	96	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	247	99	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	249	99	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	244	98	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2450	98	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	35.4	71	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804349

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:59

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	240	96	49-141	0	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	210	84	57-149	2	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	235	94	54-128	2	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	242	97	59-129	0	0-20
107-12-0	PSD Propionitrile	250	0.00 U	234	94	58-131	3	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	251	100	59-134	1	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	252	101	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	251	100	60-136	3	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2450	98	60-143	0	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	37.2	74	63-146	5	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	88.8	89	71-127
75-05-8	LCS Acetonitrile	1250	0.0	948	76	61-125
67-64-1	LCS Acetone	250	0.0	263	105	48-157
74-88-4	LCS Iodomethane	250	0.0	210	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	213	85	69-138
108-05-4	LCS Vinyl acetate	250	0.0	245	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	226	90	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	208	83	66-124
591-78-6	LCS 2-Hexanone	250	0.0	246	98	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	45.6	91	40-160
74-87-3	LCS Chloromethane	50.0	0.0	39.4	79	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	44.0	88	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.6	93	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.4	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	53.8	108	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.4	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.8	88	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	38.9	78	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	43.0	86	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.3	89	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	44.0	88	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	47.8	96	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.2	84	76-125
67-66-3	LCS Chloroform	50.0	0.0	43.9	88	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.0	88	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.3	95	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	42.7	85	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.9	92	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.6	85	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	42.8	86	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	45.2	90	78-131
108-88-3	LCS Toluene	50.0	0.0	43.1	86	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.1	94	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	42.9	86	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.0	84	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	42.5	85	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.6	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	44.0	88	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.3	85	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.5	89	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.2	92	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.3	93	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.7	83	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	41.5	83	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	43.2	86	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	44.9	90	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	43.7	87	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.5	89	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.5	93	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.2	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.0	92	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	42.4	85	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	42.3	85	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	39.5	79	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	45.7	91	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	42.5	85	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	46.3	93	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.7	85	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4640	93	63-138



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806751

Instrument: VOA4.I

Analysis Date: 06/08/2017 10:50

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	291	116	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	248	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	256	102	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	259	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	264	106	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	257	103	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2650	106	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.9	84	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203807986

Instrument: VOA4.I

Analysis Date: 06/09/2017 14:13

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	279	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	238	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	251	100	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	264	106	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	266	106	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2710	108	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	42.3	85	66-147

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060817V4\4L407.D
Lab Sample ID:	1203806749	Prep Date:	06/08/2017 11:19	Analyzed:	06/08/17 11:19
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 1671196	1203806750	060817V4\4L403A.D	06/08/17	0924
02 LCS for batch 1671196	1203806751	060817V4\4L406A.D	06/08/17	1050
03 CAWA-17-134191	424596006	060817V4\4L409.D	06/08/17	1217
04 CAWA-17-133288	424596008	060817V4\4L410.D	06/08/17	1246
05 CAWA-17-133339	424596011	060817V4\4L411.D	06/08/17	1315
06 CAWA-17-133342	424596012	060817V4\4L412.D	06/08/17	1344
07 CAWA-17-134191PS	1203804346	060817V4\4L420.D	06/08/17	1735
08 CAWA-17-134191PSD	1203804348	060817V4\4L421.D	06/08/17	1804

Method Blank Summary

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060917V4\4L508.D
Lab Sample ID:	1203807982	Prep Date:	06/09/2017 14:42	Analyzed:	06/09/17 14:42
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
10 LCS for batch 1671196	1203807986	060917V4\4L507A.D	06/09/17	1413
11 CAWA-17-134191PS	1203804347	060917V4\4L524.D	06/09/17	2230
12 CAWA-17-134191PSD	1203804349	060917V4\4L525.D	06/09/17	2259

# Quality Control Data

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		43.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		37.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		39.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		39.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		38.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		36.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		37.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		43.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		31.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		40.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		40.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.5	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		44.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		40.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		39.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		40.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.9	ug/L	0.300	1.00
78-93-3	2-Butanone		127	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		42.3	ug/L	0.300	1.00
591-78-6	2-Hexanone		158	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		41.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		44.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		175	ug/L	1.50	5.00
67-64-1	Acetone		96.3	ug/L	1.50	10.0
75-05-8	Acetonitrile		832	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		40.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.5	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.2	ug/L	0.300	1.00
75-25-2	Bromoform		41.6	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		201	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		41.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		41.0	ug/L	0.300	1.00
75-00-3	Chloroethane		46.1	ug/L	0.300	1.00
67-66-3	Chloroform		40.5	ug/L	0.300	1.00
74-87-3	Chloromethane		44.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		37.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		39.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		38.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		39.3	ug/L	0.300	1.00
74-88-4	Iodomethane		196	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		42.4	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.0	ug/L	1.00	10.0
91-20-3	Naphthalene		38.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.8	ug/L	0.300	1.00
108-88-3	Toluene		41.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		220	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		40.3	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		87.0	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		3980	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.2	ug/L	0.300	1.00
95-47-6	o-Xylene		44.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		44.1	ug/L	0.300	1.00

**Volatile  
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Sample Summary**

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		37.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		43.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		42.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.9	50.0	90	(71%-134%)
Bromofluorobenzene	49.6	50.0	99	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)



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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		35.4	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		230	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804347</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:30</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:30</b>				
<b>Data File:</b>	<b>060917V4\4L524.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		244	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		247	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		249	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		240	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		206	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
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Sample Summary**

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<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804347</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:30</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:30</b>				
<b>Data File:</b>	<b>060917V4\4L524.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	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.5	50.0	97	(71%-134%)
Bromofluorobenzene	52.5	50.0	105	(70%-131%)
Toluene-d8	46.8	50.0	94	(74%-124%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		44.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		39.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		41.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		38.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		41.0	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		38.1	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		39.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		41.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		36.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		42.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		41.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.3	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		42.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		39.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		41.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		39.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.2	ug/L	0.300	1.00
78-93-3	2-Butanone		148	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		40.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		178	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		39.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		43.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		201	ug/L	1.50	5.00
67-64-1	Acetone		112	ug/L	1.50	10.0
75-05-8	Acetonitrile		975	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		39.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.8	ug/L	0.300	1.00
75-25-2	Bromoform		43.8	ug/L	0.300	1.00

**Volatile  
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Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		44.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		198	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		40.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		40.5	ug/L	0.300	1.00
75-00-3	Chloroethane		46.4	ug/L	0.300	1.00
67-66-3	Chloroform		39.9	ug/L	0.300	1.00
74-87-3	Chloromethane		44.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		38.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		40.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		41.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		38.9	ug/L	0.300	1.00
74-88-4	Iodomethane		198	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		40.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.8	ug/L	1.00	10.0
91-20-3	Naphthalene		43.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		45.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.1	ug/L	0.300	1.00
108-88-3	Toluene		40.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		239	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.6	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		41.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		84.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		41.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		40.3	ug/L	0.300	1.00
95-47-6	o-Xylene		43.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		42.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.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		40.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		42.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		43.4	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.9	50.0	98	(71%-134%)
Bromofluorobenzene	49.9	50.0	100	(70%-131%)
Toluene-d8	49.8	50.0	100	(74%-124%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		235	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		251	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		251	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		252	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		234	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		210	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.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	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	96	(71%-134%)
Bromofluorobenzene	53.0	50.0	106	(70%-131%)
Toluene-d8	47.1	50.0	94	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Matrix: WATER

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: MB for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 11:19

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Column: DB-624

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

Volatile  
Certificate of Analysis  
Sample Summary

Page 3 of 3

SDG Number:	2017-1633	Matrix:	WATER
Lab Sample ID:	1203806749		
Client Sample:	QC for batch 1671196	Client:	ARSL004
Client ID:	MB for batch 1671196	Method:	SW-846:8260B
Batch ID:	1671196	Inst:	VOA4.I
Run Date:	06/08/2017 11:19	Analyst:	VXY1
Prep Date:	06/08/2017 11:19		
Data File:	060817V4\4L407.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	55.5	50.0	ug/L 111	(70%-131%)
Toluene-d8	50.7	50.0	ug/L 101	(74%-124%)

## Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2017-1633

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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		46.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		42.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		41.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		42.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		39.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		44.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.6	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		42.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		226	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		43.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		246	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.5	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		208	ug/L	1.50	5.00
67-64-1	Acetone		263	ug/L	1.50	10.0
75-05-8	Acetonitrile		948	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		42.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		46.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		213	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		47.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		42.3	ug/L	0.300	1.00
75-00-3	Chloroethane		50.4	ug/L	0.300	1.00
67-66-3	Chloroform		43.9	ug/L	0.300	1.00
74-87-3	Chloromethane		39.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		41.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		45.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.4	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		44.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		210	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.9	ug/L	1.00	10.0
91-20-3	Naphthalene		45.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		42.5	ug/L	0.300	1.00
108-88-3	Toluene		43.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		45.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		245	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		44.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		45.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		88.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		44.9	ug/L	0.300	1.00
95-47-6	o-Xylene		44.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.0	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806750		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 09:24	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 09:24		
<b>Data File:</b>	060817V4\4L403A.D	<b>Column:</b>	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		43.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.5	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		45.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		47.1	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.5	50.0	101	(71%-134%)
Bromofluorobenzene	54.1	50.0	108	(70%-131%)
Toluene-d8	50.5	50.0	101	(74%-124%)

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

SDG Number: 2017-1633

Lab Sample ID: 1203806751

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 10:50

Prep Date: 06/08/2017 10:50

Data File: 060817V4\4L406A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		256	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00



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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203806751		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 10:50	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 10:50		
<b>Data File:</b> 060817V4\4L406A.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		257	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		259	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		264	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		248	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806751		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 10:50	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 10:50		
<b>Data File:</b>	060817V4\4L406A.D	<b>Column:</b>	DB-624
		<b>Project:</b>	QC
		<b>SOP Ref:</b>	GL-OA-E-038
		<b>Dilution:</b>	1
		<b>Purge Vol:</b>	5 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.4	50.0	ug/L 109	(71%-134%)
Bromofluorobenzene	56.6	50.0	ug/L 113	(70%-131%)
Toluene-d8	51.0	50.0	ug/L 102	(74%-124%)

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

SDG Number: 2017-1633

Matrix: WATER

Lab Sample ID: 1203807982

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: MB for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/09/2017 14:42

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/09/2017 14:42

Data File: 060917V4\4L508.D

Column: DB-624

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

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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807982			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:42			
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.21	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

Volatile  
Certificate of Analysis  
Sample Summary

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SDG Number:	2017-1633	Matrix:	WATER
Lab Sample ID:	1203807982		
Client Sample:	QC for batch 1671196	Client:	ARSL004
Client ID:	MB for batch 1671196	Method:	SW-846:8260B
Batch ID:	1671196	Inst:	VOA4.I
Run Date:	06/09/2017 14:42	Analyst:	VXY1
Prep Date:	06/09/2017 14:42		
Data File:	060917V4\4L508.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	97	(71%-134%)
Bromofluorobenzene	54.3	50.0	109	(70%-131%)
Toluene-d8	49.2	50.0	98	(74%-124%)

## Tentatively Identified Compound Summary

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

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

<b>SDG Number:</b> 2017-1633	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203807986	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1671196	<b>Project:</b> QC
<b>Run Date:</b> 06/09/2017 14:13	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/09/2017 14:13	<b>Dilution:</b> 1
<b>Data File:</b> 060917V4\4L507A.D	<b>Purge Vol:</b> 5 mL
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		42.3	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		279	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		251	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1633		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807986			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:13			
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		261	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2710	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		266	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		269	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		264	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		238	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1633	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203807986		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/09/2017 14:13	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/09/2017 14:13		
<b>Data File:</b>	060917V4\4L507A.D	<b>Column:</b>	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.1	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	54.3	50.0	ug/L 109	(70%-131%)
Toluene-d8	48.9	50.0	ug/L 98	(74%-124%)



# **Semi-Volatile Analysis**

# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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:	1670793
Prep Batch Number:	1670792

**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>
424596006	CAWA-17-134191
424596008	CAWA-17-133288
424596011	CAWA-17-133339
1203803336	Method Blank (MB)
1203803337	Laboratory Control Sample (LCS)
1203803338	424596006(CAWA-17-134191) Matrix Spike (MS)
1203803339	424596006(CAWA-17-134191) 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 associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

#### **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 not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

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

Sample 424596006 (CAWA-17-134191) was selected for analysis as the matrix spike and matrix spike duplicate.

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

The MS and MSD recoveries were within the established acceptance limits.

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

The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data.

Sample	Analyte	Value
1203803338MS and 1203803339MSD (CAWA-17-134191)	Benzidine	100* (0%-30%)
	Pyridine	55* (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:**

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

A data exception report (DER) 1639374 was generated for sample 1203803339 (CAWA-17-134191MSD) in this SDG/batch.

##### **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 424596006 (CAWA-17-134191), 424596008 (CAWA-17-133288) and 424596011 (CAWA-17-133339) 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>
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MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)
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**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

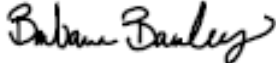
#### The Qualifiers in this report are defined as follows:

- \* 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: 28 JUN 2017

Title: Data Validator

# Sample Data Summary



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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:25	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 1000 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0508.D	<b>Column:</b> DB-5ms	

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

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>424596006</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>VOA/SVOA</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>ESHL00114</b>
<b>Client ID:</b>	<b>CAWA-17-134191</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 13:25</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>1000 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0508.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

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

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596006	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:25	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 1000 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0508.D	<b>Column:</b> DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.8	100	ug/L	61	(32%-124%)
2-Fluorobiphenyl	33.1	50.0	ug/L	66	(32%-112%)
2-Fluorophenol	37.7	100	ug/L	38	(15%-88%)
Nitrobenzene-d5	34.7	50.0	ug/L	69	(36%-115%)
Phenol-d5	22.1	100	ug/L	22	(15%-91%)
p-Terphenyl-d14	33.8	50.0	ug/L	68	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	43.2	ug/L	97	NJ

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:52	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 960 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0511.D	<b>Column:</b> DB-5ms	

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

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:52	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 960 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0511.D	<b>Column:</b> DB-5ms	

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

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 12:25	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596008	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> VOA/SVOA	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-133288	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:52	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 960 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0511.D	<b>Column:</b> DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	77.5	104	ug/L	74	(32%-124%)
2-Fluorobiphenyl	39.8	52.1	ug/L	76	(32%-112%)
2-Fluorophenol	47.2	104	ug/L	45	(15%-88%)
Nitrobenzene-d5	41.9	52.1	ug/L	80	(36%-115%)
Phenol-d5	28.1	104	ug/L	27	(15%-91%)
p-Terphenyl-d14	43.5	52.1	ug/L	83	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	50.7	ug/L	97	NJ

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

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1670793

Inst: MSD3.I

Dilution: 1

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	11.1	ug/L	3.33	11.1
120-82-1	1,2,4-Trichlorobenzene	U	11.1	ug/L	3.33	11.1
95-50-1	1,2-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
122-66-7	Azobenzene	U	11.1	ug/L	3.33	11.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
106-46-7	1,4-Dichlorobenzene	U	11.1	ug/L	3.33	11.1
123-91-1	1,4-Dioxane	U	11.1	ug/L	3.33	11.1
90-12-0	1-Methylnaphthalene	U	1.11	ug/L	0.333	1.11
58-90-2	2,3,4,6-Tetrachlorophenol	U	11.1	ug/L	3.33	11.1
95-95-4	2,4,5-Trichlorophenol	U	11.1	ug/L	3.33	11.1
88-06-2	2,4,6-Trichlorophenol	U	11.1	ug/L	3.33	11.1
120-83-2	2,4-Dichlorophenol	U	11.1	ug/L	3.33	11.1
105-67-9	2,4-Dimethylphenol	U	11.1	ug/L	3.33	11.1
51-28-5	2,4-Dinitrophenol	U	22.2	ug/L	5.56	22.2
121-14-2	2,4-Dinitrotoluene	U	11.1	ug/L	3.33	11.1
606-20-2	2,6-Dinitrotoluene	U	11.1	ug/L	3.33	11.1
91-58-7	2-Chloronaphthalene	U	1.11	ug/L	0.456	1.11
95-57-8	2-Chlorophenol	U	11.1	ug/L	3.33	11.1
534-52-1	2-Methyl-4,6-dinitrophenol	U	11.1	ug/L	3.33	11.1
91-57-6	2-Methylnaphthalene	U	1.11	ug/L	0.333	1.11
88-75-5	2-Nitrophenol	U	11.1	ug/L	3.33	11.1
91-94-1	3,3'-Dichlorobenzidine	U	11.1	ug/L	3.33	11.1
101-55-3	4-Bromophenylphenylether	U	11.1	ug/L	3.33	11.1
59-50-7	Parachlorometa cresol	U	11.1	ug/L	3.33	11.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	11.1	ug/L	3.67	11.1
7005-72-3	4-Chlorophenylphenylether	U	11.1	ug/L	3.33	11.1
100-02-7	4-Nitrophenol	U	11.1	ug/L	3.33	11.1
83-32-9	Acenaphthene	U	1.11	ug/L	0.333	1.11
208-96-8	Acenaphthylene	U	1.11	ug/L	0.333	1.11
62-53-3	Aniline	U	11.1	ug/L	4.67	11.1
120-12-7	Anthracene	U	1.11	ug/L	0.333	1.11
1912-24-9	Atrazine	U	11.1	ug/L	3.33	11.1
92-87-5	Benzidine	U	11.1	ug/L	4.33	11.1
56-55-3	Benzo(a)anthracene	U	1.11	ug/L	0.333	1.11
50-32-8	Benzo(a)pyrene	U	1.11	ug/L	0.333	1.11
205-99-2	Benzo(b)fluoranthene	U	1.11	ug/L	0.333	1.11
191-24-2	Benzo(ghi)perylene	U	1.11	ug/L	0.333	1.11

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

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1670793

Inst: MSD3.I

Dilution: 1

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.11	ug/L	0.333	1.11
65-85-0	Benzoic acid	U	22.2	ug/L	6.67	22.2
100-51-6	Benzyl alcohol	U	11.1	ug/L	3.33	11.1
85-68-7	Butylbenzylphthalate	U	11.1	ug/L	3.33	11.1
218-01-9	Chrysene	U	1.11	ug/L	0.333	1.11
84-74-2	Di-n-butylphthalate	U	11.1	ug/L	3.33	11.1
117-84-0	Di-n-octylphthalate	U	11.1	ug/L	3.33	11.1
53-70-3	Dibenzo(a,h)anthracene	U	1.11	ug/L	0.333	1.11
132-64-9	Dibenzofuran	U	11.1	ug/L	3.33	11.1
84-66-2	Diethylphthalate	U	11.1	ug/L	3.33	11.1
131-11-3	Dimethylphthalate	U	11.1	ug/L	3.33	11.1
88-85-7	Dinoseb	U	11.1	ug/L	3.33	11.1
122-39-4	Diphenylamine	U	11.1	ug/L	3.33	11.1
206-44-0	Fluoranthene	U	1.11	ug/L	0.333	1.11
86-73-7	Fluorene	U	1.11	ug/L	0.333	1.11
118-74-1	Hexachlorobenzene	U	11.1	ug/L	3.33	11.1
87-68-3	Hexachlorobutadiene	U	11.1	ug/L	3.33	11.1
77-47-4	Hexachlorocyclopentadiene	U	11.1	ug/L	3.33	11.1
67-72-1	Hexachloroethane	U	11.1	ug/L	3.33	11.1
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.11	ug/L	0.333	1.11
78-59-1	Isophorone	U	11.1	ug/L	3.89	11.1
62-75-9	N-Methyl-N-nitrosomethylamine	U	11.1	ug/L	3.33	11.1
924-16-3	N-Nitrosodi-n-butylamine	U	11.1	ug/L	3.33	11.1
55-18-5	N-Nitrosodiethylamine	U	11.1	ug/L	3.33	11.1
621-64-7	N-Nitrosodi--n-propylamine	U	11.1	ug/L	3.33	11.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	11.1	ug/L	3.33	11.1
91-20-3	Naphthalene	U	1.11	ug/L	0.333	1.11
98-95-3	Nitrobenzene	U	11.1	ug/L	3.33	11.1
608-93-5	Pentachlorobenzene	U	11.1	ug/L	3.33	11.1
87-86-5	Pentachlorophenol	U	11.1	ug/L	3.33	11.1
85-01-8	Phenanthrene	U	1.11	ug/L	0.333	1.11
108-95-2	Phenol	U	11.1	ug/L	3.33	11.1
129-00-0	Pyrene	U	1.11	ug/L	0.333	1.11
110-86-1	Pyridine	U	11.1	ug/L	3.33	11.1
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	11.1	ug/L	3.33	11.1
111-91-1	bis(2-Chloroethoxy)methane	U	11.1	ug/L	3.33	11.1
111-44-4	bis(2-Chloroethyl) ether	U	11.1	ug/L	3.33	11.1
117-81-7	bis(2-Ethylhexyl)phthalate	U	11.1	ug/L	3.33	11.1



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

Page 3 of 3

SDG Number: 2017-1633

Lab Sample ID: 424596011

Date Collected: 05/31/2017 12:25

Date Received: 06/02/2017 09:00

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD3.I

Dilution: 1

Batch ID: 1670793

Run Date: 06/05/2017 15:22

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 900 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0512.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	11.1	ug/L	4.11	11.1
99-09-2	3-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	11.1	ug/L	3.33	11.1
88-74-4	2-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	11.1	ug/L	3.33	11.1
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.0	111	ug/L	73 (32%-124%)
2-Fluorobiphenyl	45.1	55.6	ug/L	81 (32%-112%)
2-Fluorophenol	49.2	111	ug/L	44 (15%-88%)
Nitrobenzene-d5	47.4	55.6	ug/L	85 (36%-115%)
Phenol-d5	30.3	111	ug/L	27 (15%-91%)
p-Terphenyl-d14	44.1	55.6	ug/L	79 (36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	2.066	4.46	ug/L	0	J
000067-66-3	Trichloromethane	2.184	53.3	ug/L	97	NJ

# **Quality Control Summary**

Semi-Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1633

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203803336	MB for batch 1670792	48	29	87	82	80	93
1203803337	LCS for batch 1670792	42	27	68	72	80	70
424596006	CAWA-17-134191	38	22	69	66	61	68
1203803338	CAWA-17-134191MS	62	51	82	79	84	84
1203803339	CAWA-17-134191MSD	67	53	86	81	90	91
424596008	CAWA-17-133288	45	27	80	76	74	83
424596011	CAWA-17-133339	44	27	85	81	73	79

**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 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	50.0	0.0	21.3	43	30-88
110-86-1	LCS Pyridine	50.0	0.0	15.8	32	27-89
62-53-3	LCS Aniline	50.0	0.0	32.4	65	49-112
108-95-2	LCS Phenol	50.0	0.0	13.7	27	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	34.5	69	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	32.8	66	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	28.7	57	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	29.2	58	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	30.0	60	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	33.5	67	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	30.3	61	44-102
95-48-7	LCS o-Cresol	50.0	0.0	29.8	60	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	33.3	67	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	38.2	76	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	27.1	54	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	33.2	66	53-115
78-59-1	LCS Isophorone	50.0	0.0	33.6	67	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	31.3	63	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	30.8	62	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	33.9	68	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	33.3	67	53-109
65-85-0	LCS Benzoic acid	100	0.0	25.9	26	21-74

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	42.0	84	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	27.2	54	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	34.9	70	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	31.3	63	42-103
91-20-3	LCS Naphthalene	50.0	0.0	34.4	69	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	32.1	64	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	38.3	77	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	34.4	69	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	31.1	62	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	37.2	74	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	43.5	87	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	37.1	74	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	35.4	71	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	36.6	73	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	37.5	75	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	39.7	79	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	38.2	76	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	34.7	69	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	36.5	73	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	37.7	75	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	11.9	24	15-137

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	39.4	79	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	38.1	76	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	39.4	79	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	37.2	74	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	36.9	74	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	37.9	76	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	34.6	69	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	35.3	71	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	44.0	88	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.7	79	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.7	79	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	38.5	77	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	43.2	86	54-118
129-00-0	LCS Pyrene	50.0	0.0	35.4	71	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	33.8	68	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	36.9	74	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	40.1	80	57-112
218-01-9	LCS Chrysene	50.0	0.0	41.3	83	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	34.6	69	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	38.9	78	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	42.9	86	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	40.5	81	40-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1670792

Matrix: WATER

Lab Sample ID 1203803337

Instrument: MSD3.I

Analysis Date: 06/05/2017 12:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	43.5	87	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	45.7	91	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	46.8	94	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	22.3	45	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	36.3	73	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	30.6	61	44-102
1912-24-9	LCS Atrazine	50.0	0.0	40.0	80	60-131
92-87-5	LCS Benzidine	100	0.0	33.8	34	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	38.0	76	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	28.8	58	39-99

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	120	0.00 U	77.6	64	25-106
110-86-1	MS Pyridine	120	0.00 U	42.6	35	24-93
62-53-3	MS Aniline	120	0.00 U	87.8	73	37-113
108-95-2	MS Phenol	120	0.00 U	63.1	52	23-82
111-44-4	MS bis(2-Chloroethyl) ether	120	0.00 U	92.8	77	39-114
95-57-8	MS 2-Chlorophenol	120	0.00 U	91.4	76	37-108
541-73-1	MS 1,3-Dichlorobenzene	120	0.00 U	79.3	66	27-97
106-46-7	MS 1,4-Dichlorobenzene	120	0.00 U	80.3	67	28-97
95-50-1	MS 1,2-Dichlorobenzene	120	0.00 U	83.1	69	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	120	0.00 U	92.2	77	32-127
100-51-6	MS Benzyl alcohol	120	0.00 U	93.6	78	37-116
95-48-7	MS o-Cresol	120	0.00 U	91.4	76	34-109
65794-96-9	MS m,p-Cresols	120	0.00 U	109	90	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	120	0.00 U	106	88	42-118
67-72-1	MS Hexachloroethane	120	0.00 U	75.7	63	29-94
98-95-3	MS Nitrobenzene	120	0.00 U	98.6	82	38-123
78-59-1	MS Isophorone	120	0.00 U	98.5	82	43-120
88-75-5	MS 2-Nitrophenol	120	0.00 U	96.2	80	39-115
105-67-9	MS 2,4-Dimethylphenol	120	0.00 U	92.1	76	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	120	0.00 U	102	84	42-118
120-83-2	MS 2,4-Dichlorophenol	120	0.00 U	99.3	82	40-111
65-85-0	MS Benzoic acid	241	0.00 U	122	51	17-95



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	120	0.00	U	123	102	44-138
87-68-3	MS	Hexachlorobutadiene	120	0.00	U	85.5	71	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	120	0.00	U	101	84	41-122
91-57-6	MS	2-Methylnaphthalene	120	0.00	U	97.1	81	29-109
91-20-3	MS	Naphthalene	120	0.00	U	105	88	31-108
90-12-0	MS	1-Methylnaphthalene	120	0.00	U	99.1	82	33-112
77-47-4	MS	Hexachlorocyclopentadiene	120	0.00	U	62.7	52	26-79
88-06-2	MS	2,4,6-Trichlorophenol	120	0.00	U	102	84	39-124
95-95-4	MS	2,4,5-Trichlorophenol	120	0.00	U	91.6	76	42-120
91-58-7	MS	2-Chloronaphthalene	120	0.00	U	89.2	74	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	120	0.00	U	95.7	79	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	120	0.00	U	112	93	42-144
131-11-3	MS	Dimethylphthalate	120	0.00	U	95.0	79	45-128
606-20-2	MS	2,6-Dinitrotoluene	120	0.00	U	91.7	76	46-124
121-14-2	MS	2,4-Dinitrotoluene	120	0.00	U	93.9	78	45-125
208-96-8	MS	Acenaphthylene	120	0.00	U	102	85	35-120
83-32-9	MS	Acenaphthene	120	0.00	U	110	92	35-117
51-28-5	MS	2,4-Dinitrophenol	120	0.00	U	98.9	82	27-122
132-64-9	MS	Dibenzofuran	120	0.00	U	95.3	79	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	120	0.00	U	97.1	81	40-128
84-66-2	MS	Diethylphthalate	120	0.00	U	96.5	80	43-127
100-02-7	MS	4-Nitrophenol	120	0.00	U	57.3	48	17-85

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	120	0.00	U	108	90	39-117
7005-72-3	MS	4-Chlorophenylphenylether	120	0.00	U	106	88	39-121
100-01-6	MS	4-Nitroaniline <i>p</i> -Nitroaniline	120	0.00	U	103	86	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	120	0.00	U	96.1	80	32-126
122-39-4	MS	Diphenylamine	120	0.00	U	96.1	80	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	120	0.00	U	102	84	38-120
101-55-3	MS	4-Bromophenylphenylether	120	0.00	U	95.4	79	39-121
118-74-1	MS	Hexachlorobenzene	120	0.00	U	94.0	78	40-118
87-86-5	MS	Pentachlorophenol	120	0.00	U	115	96	35-121
85-01-8	MS	Phenanthrene	120	0.00	U	104	86	40-115
120-12-7	MS	Anthracene	120	0.00	U	103	85	38-120
84-74-2	MS	Di-n-butylphthalate	120	0.00	U	96.5	80	41-128
206-44-0	MS	Fluoranthene	120	0.00	U	105	87	41-119
129-00-0	MS	Pyrene	120	0.00	U	107	89	35-128
85-68-7	MS	Butylbenzylphthalate	120	0.00	U	94.3	78	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	120	0.00	U	99.5	83	38-131
56-55-3	MS	Benzo(a)anthracene	120	0.00	U	103	85	39-120
218-01-9	MS	Chrysene	120	0.00	U	106	88	41-124
117-84-0	MS	Di-n-octylphthalate	120	0.00	U	84.7	70	37-134
205-99-2	MS	Benzo(b)fluoranthene	120	0.00	U	102	84	31-122
207-08-9	MS	Benzo(k)fluoranthene	120	0.00	U	114	95	33-123
50-32-8	MS	Benzo(a)pyrene	120	0.00	U	104	86	32-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: CAWA-17-134191MS

Matrix: W

Lab Sample ID 1203803338

Instrument: MSD3.I

Analysis Date: 06/05/2017 13:54

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	92.3	77	27-121
53-70-3	MS Dibenzo(a,h)anthracene	120	0.00 U	100	83	30-125
191-24-2	MS Benzo(ghi)perylene	120	0.00 U	102	85	24-126
123-91-1	MS 1,4-Dioxane	120	0.00 U	77.4	64	24-110
930-55-2	MS N-Nitrosopyrrolidine	120	0.00 U	105	87	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	120	0.00 U	90.2	75	32-101
1912-24-9	MS Atrazine	120	0.00 U	105	87	42-129
92-87-5	MS Benzidine	241	0.00 U	42.5	18	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	120	0.00 U	90.1	75	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	120	0.00 U	89.6	74	26-102

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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-nitrosomethylam	120	0.00 U	78.4	65	25-106	1	0-30
110-86-1	MSD Pyridine	120	0.00 U	75.3	62	24-93	55 *	0-30
62-53-3	MSD Aniline	120	0.00 U	100	83	37-113	13	0-30
108-95-2	MSD Phenol	120	0.00 U	62.6	52	23-82	1	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	120	0.00 U	95.4	79	39-114	3	0-30
95-57-8	MSD 2-Chlorophenol	120	0.00 U	93.3	77	37-108	2	0-30
541-73-1	MSD 1,3-Dichlorobenzene	120	0.00 U	82.0	68	27-97	3	0-30
106-46-7	MSD 1,4-Dichlorobenzene	120	0.00 U	83.4	69	28-97	4	0-30
95-50-1	MSD 1,2-Dichlorobenzene	120	0.00 U	85.8	71	28-99	3	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	120	0.00 U	95.6	79	32-127	4	0-30
100-51-6	MSD Benzyl alcohol	120	0.00 U	94.0	78	37-116	0	0-30
95-48-7	MSD o-Cresol	120	0.00 U	92.3	77	34-109	1	0-30
65794-96-9	MSD m,p-Cresols	120	0.00 U	111	92	36-120	2	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	120	0.00 U	108	90	42-118	2	0-30
67-72-1	MSD Hexachloroethane	120	0.00 U	79.1	66	29-94	4	0-30
98-95-3	MSD Nitrobenzene	120	0.00 U	98.7	82	38-123	0	0-30
78-59-1	MSD Isophorone	120	0.00 U	99.5	83	43-120	1	0-30
88-75-5	MSD 2-Nitrophenol	120	0.00 U	98.8	82	39-115	3	0-30
105-67-9	MSD 2,4-Dimethylphenol	120	0.00 U	93.4	78	39-107	1	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	120	0.00 U	101	84	42-118	0	0-30
120-83-2	MSD 2,4-Dichlorophenol	120	0.00 U	101	84	40-111	2	0-30
65-85-0	MSD Benzoic acid	241	0.00 U	119	49	17-95	2	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	124	103	44-138	1	0-30
87-68-3	MSD Hexachlorobutadiene	120	0.00 U	83.9	70	26-98	2	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	120	0.00 U	105	88	41-122	4	0-30
91-57-6	MSD 2-Methylnaphthalene	120	0.00 U	97.5	81	29-109	0	0-30
91-20-3	MSD Naphthalene	120	0.00 U	106	88	31-108	0	0-30
90-12-0	MSD 1-Methylnaphthalene	120	0.00 U	99.1	82	33-112	0	0-30
77-47-4	MSD Hexachlorocyclopentadiene	120	0.00 U	58.3	48	26-79	7	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	120	0.00 U	101	84	39-124	1	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	120	0.00 U	92.9	77	42-120	1	0-30
91-58-7	MSD 2-Chloronaphthalene	120	0.00 U	86.2	72	29-113	3	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	120	0.00 U	96.1	80	41-121	0	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	120	0.00 U	112	93	42-144	0	0-30
131-11-3	MSD Dimethylphthalate	120	0.00 U	95.9	80	45-128	1	0-30
606-20-2	MSD 2,6-Dinitrotoluene	120	0.00 U	92.1	76	46-124	0	0-30
121-14-2	MSD 2,4-Dinitrotoluene	120	0.00 U	95.2	79	45-125	1	0-30
208-96-8	MSD Acenaphthylene	120	0.00 U	100	83	35-120	2	0-30
83-32-9	MSD Acenaphthene	120	0.00 U	108	89	35-117	2	0-30
51-28-5	MSD 2,4-Dinitrophenol	120	0.00 U	98.9	82	27-122	0	0-30
132-64-9	MSD Dibenzofuran	120	0.00 U	94.4	78	38-113	1	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	120	0.00 U	99.5	83	40-128	2	0-30
84-66-2	MSD Diethylphthalate	120	0.00 U	97.7	81	43-127	1	0-30
100-02-7	MSD 4-Nitrophenol	120	0.00 U	55.0	46	17-85	4	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	107	89	39-117	1	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	120	0.00 U	105	87	39-121	1	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	120	0.00 U	101	83	30-133	3	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	120	0.00 U	95.6	79	32-126	1	0-30
122-39-4	MSD Diphenylamine	120	0.00 U	94.4	78	37-118	2	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	120	0.00 U	100	83	38-120	1	0-30
101-55-3	MSD 4-Bromophenylphenylether	120	0.00 U	93.5	78	39-121	2	0-30
118-74-1	MSD Hexachlorobenzene	120	0.00 U	93.6	78	40-118	0	0-30
87-86-5	MSD Pentachlorophenol	120	0.00 U	117	98	35-121	2	0-30
85-01-8	MSD Phenanthrene	120	0.00 U	104	86	40-115	0	0-30
120-12-7	MSD Anthracene	120	0.00 U	103	85	38-120	0	0-30
84-74-2	MSD Di-n-butylphthalate	120	0.00 U	98.6	82	41-128	2	0-30
206-44-0	MSD Fluoranthene	120	0.00 U	105	87	41-119	0	0-30
129-00-0	MSD Pyrene	120	0.00 U	110	92	35-128	3	0-30
85-68-7	MSD Butylbenzylphthalate	120	0.00 U	97.3	81	40-129	3	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	120	0.00 U	101	84	38-131	2	0-30
56-55-3	MSD Benzo(a)anthracene	120	0.00 U	104	87	39-120	2	0-30
218-01-9	MSD Chrysene	120	0.00 U	107	89	41-124	1	0-30
117-84-0	MSD Di-n-octylphthalate	120	0.00 U	83.3	69	37-134	2	0-30
205-99-2	MSD Benzo(b)fluoranthene	120	0.00 U	108	90	31-122	6	0-30
207-08-9	MSD Benzo(k)fluoranthene	120	0.00 U	118	98	33-123	3	0-30
50-32-8	MSD Benzo(a)pyrene	120	0.00 U	105	87	32-118	1	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1633

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134191MSD

Matrix: W

Lab Sample ID 1203803339

Instrument: MSD3.I

Analysis Date: 06/05/2017 14:23

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1670792

Inj. Vol: 1 uL

Batch ID: 1670793

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	120	0.00 U	91.9	76	27-121	0	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	120	0.00 U	100	83	30-125	0	0-30
191-24-2	MSD Benzo(ghi)perylene	120	0.00 U	103	85	24-126	0	0-30
123-91-1	MSD 1,4-Dioxane	120	0.00 U	78.8	65	24-110	2	0-30
930-55-2	MSD N-Nitrosopyrrolidine	120	0.00 U	109	90	47-119	4	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	120	0.00 U	86.5	72	32-101	4	0-30
1912-24-9	MSD Atrazine	120	0.00 U	103	85	42-129	2	0-30
92-87-5	MSD Benzidine	241	0.00 U	128	53	15-130	100 *	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	120	0.00 U	92.3	77	34-124	2	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	120	0.00 U	89.1	74	26-102	1	0-30

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1670792	Instrument ID:	MSD3.I	Data File:	s060517.B\s3f0506.D
Lab Sample ID:	1203803336	Prep Date:	06/05/2017 04:55	Analyzed:	06/05/17 12:27
Column:	DB-5ms				

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 1670792	1203803337	s060517.B\s3f0507.D	06/05/17	1256
02 CAWA-17-134191	424596006	s060517.B\s3f0508.D	06/05/17	1325
03 CAWA-17-134191MS	1203803338	s060517.B\s3f0509.D	06/05/17	1354
04 CAWA-17-134191MSD	1203803339	s060517.B\s3f0510.D	06/05/17	1423
05 CAWA-17-133288	424596008	s060517.B\s3f0511.D	06/05/17	1452
06 CAWA-17-133339	424596011	s060517.B\s3f0512.D	06/05/17	1522



# Quality Control Data

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

SDG Number: 2017-1633

Lab Sample ID: 1203803336

Client Sample: QC for batch 1670792

Client ID: MB for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:27

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0506.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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

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

SDG Number: 2017-1633

Lab Sample ID: 1203803336

Client Sample: QC for batch 1670792

Client ID: MB for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:27

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0506.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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	1.00	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	20.0	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	10.0	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	10.0	ug/L	3.00	10.0
218-01-9	Chrysene	U	1.00	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	10.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	10.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	1.00	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	10.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	10.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	10.0	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	10.0	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	1.00	ug/L	0.300	1.00
86-73-7	Fluorene	U	1.00	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	10.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	10.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	10.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	10.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.00	ug/L	0.300	1.00
78-59-1	Isophorone	U	10.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine	U	10.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	10.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	10.0	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	1.00	ug/L	0.300	1.00
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
129-00-0	Pyrene	U	1.00	ug/L	0.300	1.00
110-86-1	Pyridine	U	10.0	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	10.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	10.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.0	ug/L	3.00	10.0

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

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**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203803336  
**Client Sample:** QC for batch 1670792  
**Client ID:** MB for batch 1670792  
**Batch ID:** 1670793  
**Run Date:** 06/05/2017 12:27  
**Prep Date:** 06/05/2017 04:55  
**Data File:** s060517.B\s3f0506.D

**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD3.I  
**Analyst:** JLD1  
**Aliquot:** 1000 mL  
**Column:** DB-5ms

**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	U	10.0	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.0	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.5	100	ug/L	80	(32%-124%)
2-Fluorobiphenyl	40.9	50.0	ug/L	82	(32%-112%)
2-Fluorophenol	48.1	100	ug/L	48	(15%-88%)
Nitrobenzene-d5	43.7	50.0	ug/L	87	(36%-115%)
Phenol-d5	28.6	100	ug/L	29	(15%-91%)
p-Terphenyl-d14	46.3	50.0	ug/L	93	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	49.5	ug/L	97	NJ
	unknown	2.42	4.02	ug/L	0	J

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

SDG Number: 2017-1633

Lab Sample ID: 1203803337

Client Sample: QC for batch 1670792

Client ID: LCS for batch 1670792

Batch ID: 1670793

Run Date: 06/05/2017 12:56

Prep Date: 06/05/2017 04:55

Data File: s060517.B\s3f0507.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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		30.6	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		28.8	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		30.0	ug/L	3.00	10.0
122-66-7	Azobenzene		37.9	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		28.7	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		29.2	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		22.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		32.1	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		36.5	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		34.4	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		38.3	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		33.3	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		30.8	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		38.2	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		36.6	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		35.4	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		31.1	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		32.8	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		37.2	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		31.3	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		31.3	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		38.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		34.6	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		34.9	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		42.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		38.1	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		11.9	ug/L	3.00	10.0
83-32-9	Acenaphthene		39.7	ug/L	0.300	1.00
208-96-8	Acenaphthylene		37.5	ug/L	0.300	1.00
62-53-3	Aniline		32.4	ug/L	4.20	10.0
120-12-7	Anthracene		39.7	ug/L	0.300	1.00
1912-24-9	Atrazine		40.0	ug/L	3.00	10.0
92-87-5	Benzidine		33.8	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		40.1	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		40.5	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		38.9	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		46.8	ug/L	0.300	1.00

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

SDG Number: 2017-1633

Matrix: WATER

Lab Sample ID: 1203803337

Client Sample: QC for batch 1670792

Client: ARSL004

Project: QC

Client ID: LCS for batch 1670792

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1670793

Inst: MSD3.I

Dilution: 1

Run Date: 06/05/2017 12:56

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/05/2017 04:55

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s060517.B\s3f0507.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		42.9	ug/L	0.300	1.00
65-85-0	Benzoic acid		25.9	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.3	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		33.8	ug/L	3.00	10.0
218-01-9	Chrysene		41.3	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		38.5	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		34.6	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		45.7	ug/L	0.300	1.00
132-64-9	Dibenzofuran		34.7	ug/L	3.00	10.0
84-66-2	Diethylphthalate		37.7	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		37.1	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		36.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		43.2	ug/L	0.300	1.00
86-73-7	Fluorene		39.4	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		35.3	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		27.2	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		20.9	ug/L	3.00	10.0
67-72-1	Hexachloroethane		27.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		43.5	ug/L	0.300	1.00
78-59-1	Isophorone		33.6	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		21.3	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		38.2	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		36.3	ug/L	3.00	10.0
91-20-3	Naphthalene		34.4	ug/L	0.300	1.00
98-95-3	Nitrobenzene		33.2	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		44.0	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.7	ug/L	0.300	1.00
108-95-2	Phenol		13.7	ug/L	3.00	10.0
129-00-0	Pyrene		35.4	ug/L	0.300	1.00
110-86-1	Pyridine		15.8	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		33.5	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		33.9	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		34.5	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		36.9	ug/L	3.00	10.0

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

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<b>SDG Number:</b> 2017-1633	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203803337	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1670792	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I
<b>Run Date:</b> 06/05/2017 12:56	<b>Analyst:</b> JLD1
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s060517.B\s3f0507.D	<b>Column:</b> DB-5ms
	<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		33.3	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		43.5	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		29.8	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		37.2	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		39.4	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.7	100	ug/L	80	(32%-124%)
2-Fluorobiphenyl	35.8	50.0	ug/L	72	(32%-112%)
2-Fluorophenol	42.0	100	ug/L	42	(15%-88%)
Nitrobenzene-d5	34.0	50.0	ug/L	68	(36%-115%)
Phenol-d5	26.8	100	ug/L	27	(15%-91%)
p-Terphenyl-d14	35.1	50.0	ug/L	70	(36%-121%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803338	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:54	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0509.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		90.2	ug/L	7.23	24.1
120-82-1	1,2,4-Trichlorobenzene		89.6	ug/L	7.23	24.1
95-50-1	1,2-Dichlorobenzene		83.1	ug/L	7.23	24.1
122-66-7	Azobenzene		102	ug/L	7.23	24.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		79.3	ug/L	7.23	24.1
106-46-7	1,4-Dichlorobenzene		80.3	ug/L	7.23	24.1
123-91-1	1,4-Dioxane		77.4	ug/L	7.23	24.1
90-12-0	1-Methylnaphthalene		99.1	ug/L	0.723	2.41
58-90-2	2,3,4,6-Tetrachlorophenol		97.1	ug/L	7.23	24.1
95-95-4	2,4,5-Trichlorophenol		91.6	ug/L	7.23	24.1
88-06-2	2,4,6-Trichlorophenol		102	ug/L	7.23	24.1
120-83-2	2,4-Dichlorophenol		99.3	ug/L	7.23	24.1
105-67-9	2,4-Dimethylphenol		92.1	ug/L	7.23	24.1
51-28-5	2,4-Dinitrophenol		98.9	ug/L	12.0	48.2
121-14-2	2,4-Dinitrotoluene		93.9	ug/L	7.23	24.1
606-20-2	2,6-Dinitrotoluene		91.7	ug/L	7.23	24.1
91-58-7	2-Chloronaphthalene		89.2	ug/L	0.988	2.41
95-57-8	2-Chlorophenol		91.4	ug/L	7.23	24.1
534-52-1	2-Methyl-4,6-dinitrophenol		96.1	ug/L	7.23	24.1
91-57-6	2-Methylnaphthalene		97.1	ug/L	0.723	2.41
88-75-5	2-Nitrophenol		96.2	ug/L	7.23	24.1
91-94-1	3,3'-Dichlorobenzidine		90.1	ug/L	7.23	24.1
101-55-3	4-Bromophenylphenylether		95.4	ug/L	7.23	24.1
59-50-7	Parachlorometa cresol		101	ug/L	7.23	24.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		123	ug/L	7.95	24.1
7005-72-3	4-Chlorophenylphenylether		106	ug/L	7.23	24.1
100-02-7	4-Nitrophenol		57.3	ug/L	7.23	24.1
83-32-9	Acenaphthene		110	ug/L	0.723	2.41
208-96-8	Acenaphthylene		102	ug/L	0.723	2.41
62-53-3	Aniline		87.8	ug/L	10.1	24.1
120-12-7	Anthracene		103	ug/L	0.723	2.41
1912-24-9	Atrazine		105	ug/L	7.23	24.1
92-87-5	Benzidine		42.5	ug/L	9.40	24.1
56-55-3	Benzo(a)anthracene		103	ug/L	0.723	2.41
50-32-8	Benzo(a)pyrene		104	ug/L	0.723	2.41
205-99-2	Benzo(b)fluoranthene		102	ug/L	0.723	2.41
191-24-2	Benzo(ghi)perylene		102	ug/L	0.723	2.41



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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803338	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:54	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0509.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		114	ug/L	0.723	2.41
65-85-0	Benzoic acid		122	ug/L	14.5	48.2
100-51-6	Benzyl alcohol		93.6	ug/L	7.23	24.1
85-68-7	Butylbenzylphthalate		94.3	ug/L	7.23	24.1
218-01-9	Chrysene		106	ug/L	0.723	2.41
84-74-2	Di-n-butylphthalate		96.5	ug/L	7.23	24.1
117-84-0	Di-n-octylphthalate		84.7	ug/L	7.23	24.1
53-70-3	Dibenzo(a,h)anthracene		100	ug/L	0.723	2.41
132-64-9	Dibenzofuran		95.3	ug/L	7.23	24.1
84-66-2	Diethylphthalate		96.5	ug/L	7.23	24.1
131-11-3	Dimethylphthalate		95.0	ug/L	7.23	24.1
88-85-7	Dinoseb	U	24.1	ug/L	7.23	24.1
122-39-4	Diphenylamine		96.1	ug/L	7.23	24.1
206-44-0	Fluoranthene		105	ug/L	0.723	2.41
86-73-7	Fluorene		108	ug/L	0.723	2.41
118-74-1	Hexachlorobenzene		94.0	ug/L	7.23	24.1
87-68-3	Hexachlorobutadiene		85.5	ug/L	7.23	24.1
77-47-4	Hexachlorocyclopentadiene		62.7	ug/L	7.23	24.1
67-72-1	Hexachloroethane		75.7	ug/L	7.23	24.1
193-39-5	Indeno(1,2,3-cd)pyrene		92.3	ug/L	0.723	2.41
78-59-1	Isophorone		98.5	ug/L	8.43	24.1
62-75-9	N-Methyl-N-nitrosomethylamine		77.6	ug/L	7.23	24.1
924-16-3	N-Nitrosodi-n-butylamine	U	24.1	ug/L	7.23	24.1
55-18-5	N-Nitrosodiethylamine	U	24.1	ug/L	7.23	24.1
621-64-7	N-Nitrosodi--n-propylamine		106	ug/L	7.23	24.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		105	ug/L	7.23	24.1
91-20-3	Naphthalene		105	ug/L	0.723	2.41
98-95-3	Nitrobenzene		98.6	ug/L	7.23	24.1
608-93-5	Pentachlorobenzene	U	24.1	ug/L	7.23	24.1
87-86-5	Pentachlorophenol		115	ug/L	7.23	24.1
85-01-8	Phenanthrene		104	ug/L	0.723	2.41
108-95-2	Phenol		63.1	ug/L	7.23	24.1
129-00-0	Pyrene		107	ug/L	0.723	2.41
110-86-1	Pyridine		42.6	ug/L	7.23	24.1
108-60-1	bis(2-Chloro-1-methylethyl)ether		92.2	ug/L	7.23	24.1
111-91-1	bis(2-Chloroethoxy)methane		102	ug/L	7.23	24.1
111-44-4	bis(2-Chloroethyl) ether		92.8	ug/L	7.23	24.1
117-81-7	bis(2-Ethylhexyl)phthalate		99.5	ug/L	7.23	24.1

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803338	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 13:54	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0509.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		109	ug/L	8.92	24.1
99-09-2	3-Nitroaniline		112	ug/L	7.23	24.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		91.4	ug/L	7.23	24.1
88-74-4	2-Nitroaniline		95.7	ug/L	7.23	24.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		103	ug/L	7.23	24.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	203	241	ug/L	84	(32%-124%)
2-Fluorobiphenyl	95.3	120	ug/L	79	(32%-112%)
2-Fluorophenol	150	241	ug/L	62	(15%-88%)
Nitrobenzene-d5	98.6	120	ug/L	82	(36%-115%)
Phenol-d5	122	241	ug/L	51	(15%-91%)
p-Terphenyl-d14	102	120	ug/L	84	(36%-121%)

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

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803339	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:23	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0510.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		86.5	ug/L	7.23	24.1
120-82-1	1,2,4-Trichlorobenzene		89.1	ug/L	7.23	24.1
95-50-1	1,2-Dichlorobenzene		85.8	ug/L	7.23	24.1
122-66-7	Azobenzene		100	ug/L	7.23	24.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		82.0	ug/L	7.23	24.1
106-46-7	1,4-Dichlorobenzene		83.4	ug/L	7.23	24.1
123-91-1	1,4-Dioxane		78.8	ug/L	7.23	24.1
90-12-0	1-Methylnaphthalene		99.1	ug/L	0.723	2.41
58-90-2	2,3,4,6-Tetrachlorophenol		99.5	ug/L	7.23	24.1
95-95-4	2,4,5-Trichlorophenol		92.9	ug/L	7.23	24.1
88-06-2	2,4,6-Trichlorophenol		101	ug/L	7.23	24.1
120-83-2	2,4-Dichlorophenol		101	ug/L	7.23	24.1
105-67-9	2,4-Dimethylphenol		93.4	ug/L	7.23	24.1
51-28-5	2,4-Dinitrophenol		98.9	ug/L	12.0	48.2
121-14-2	2,4-Dinitrotoluene		95.2	ug/L	7.23	24.1
606-20-2	2,6-Dinitrotoluene		92.1	ug/L	7.23	24.1
91-58-7	2-Chloronaphthalene		86.2	ug/L	0.988	2.41
95-57-8	2-Chlorophenol		93.3	ug/L	7.23	24.1
534-52-1	2-Methyl-4,6-dinitrophenol		95.6	ug/L	7.23	24.1
91-57-6	2-Methylnaphthalene		97.5	ug/L	0.723	2.41
88-75-5	2-Nitrophenol		98.8	ug/L	7.23	24.1
91-94-1	3,3'-Dichlorobenzidine		92.3	ug/L	7.23	24.1
101-55-3	4-Bromophenylphenylether		93.5	ug/L	7.23	24.1
59-50-7	Parachlorometa cresol		105	ug/L	7.23	24.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		124	ug/L	7.95	24.1
7005-72-3	4-Chlorophenylphenylether		105	ug/L	7.23	24.1
100-02-7	4-Nitrophenol		55.0	ug/L	7.23	24.1
83-32-9	Acenaphthene		108	ug/L	0.723	2.41
208-96-8	Acenaphthylene		100	ug/L	0.723	2.41
62-53-3	Aniline		100	ug/L	10.1	24.1
120-12-7	Anthracene		103	ug/L	0.723	2.41
1912-24-9	Atrazine		103	ug/L	7.23	24.1
92-87-5	Benzidine		128	ug/L	9.40	24.1
56-55-3	Benzo(a)anthracene		104	ug/L	0.723	2.41
50-32-8	Benzo(a)pyrene		105	ug/L	0.723	2.41
205-99-2	Benzo(b)fluoranthene		108	ug/L	0.723	2.41
191-24-2	Benzo(ghi)perylene		103	ug/L	0.723	2.41

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

<b>SDG Number:</b>	<b>2017-1633</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203803339</b>	<b>Date Received:</b>	<b>06/02/2017 12:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1670792</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191MSD</b>	<b>Method:</b>	<b>SW846 3510C/8270D</b>	<b>SOP Ref:</b>	<b>GL-OA-E-009</b>
<b>Batch ID:</b>	<b>1670793</b>	<b>Inst:</b>	<b>MSD3.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/05/2017 14:23</b>	<b>Analyst:</b>	<b>JLD1</b>	<b>Inj. Vol:</b>	<b>1 uL</b>
<b>Prep Date:</b>	<b>06/05/2017 04:55</b>	<b>Aliquot:</b>	<b>415 mL</b>	<b>Final Volume:</b>	<b>1 mL</b>
<b>Data File:</b>	<b>s060517.B\s3f0510.D</b>	<b>Column:</b>	<b>DB-5ms</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		118	ug/L	0.723	2.41
65-85-0	Benzoic acid		119	ug/L	14.5	48.2
100-51-6	Benzyl alcohol		94.0	ug/L	7.23	24.1
85-68-7	Butylbenzylphthalate		97.3	ug/L	7.23	24.1
218-01-9	Chrysene		107	ug/L	0.723	2.41
84-74-2	Di-n-butylphthalate		98.6	ug/L	7.23	24.1
117-84-0	Di-n-octylphthalate		83.3	ug/L	7.23	24.1
53-70-3	Dibenzo(a,h)anthracene		100	ug/L	0.723	2.41
132-64-9	Dibenzofuran		94.4	ug/L	7.23	24.1
84-66-2	Diethylphthalate		97.7	ug/L	7.23	24.1
131-11-3	Dimethylphthalate		95.9	ug/L	7.23	24.1
88-85-7	Dinoseb	U	24.1	ug/L	7.23	24.1
122-39-4	Diphenylamine		94.4	ug/L	7.23	24.1
206-44-0	Fluoranthene		105	ug/L	0.723	2.41
86-73-7	Fluorene		107	ug/L	0.723	2.41
118-74-1	Hexachlorobenzene		93.6	ug/L	7.23	24.1
87-68-3	Hexachlorobutadiene		83.9	ug/L	7.23	24.1
77-47-4	Hexachlorocyclopentadiene		58.3	ug/L	7.23	24.1
67-72-1	Hexachloroethane		79.1	ug/L	7.23	24.1
193-39-5	Indeno(1,2,3-cd)pyrene		91.9	ug/L	0.723	2.41
78-59-1	Isophorone		99.5	ug/L	8.43	24.1
62-75-9	N-Methyl-N-nitrosomethylamine		78.4	ug/L	7.23	24.1
924-16-3	N-Nitrosodi-n-butylamine	U	24.1	ug/L	7.23	24.1
55-18-5	N-Nitrosodiethylamine	U	24.1	ug/L	7.23	24.1
621-64-7	N-Nitrosodi--n-propylamine		108	ug/L	7.23	24.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		109	ug/L	7.23	24.1
91-20-3	Naphthalene		106	ug/L	0.723	2.41
98-95-3	Nitrobenzene		98.7	ug/L	7.23	24.1
608-93-5	Pentachlorobenzene	U	24.1	ug/L	7.23	24.1
87-86-5	Pentachlorophenol		117	ug/L	7.23	24.1
85-01-8	Phenanthrene		104	ug/L	0.723	2.41
108-95-2	Phenol		62.6	ug/L	7.23	24.1
129-00-0	Pyrene		110	ug/L	0.723	2.41
110-86-1	Pyridine		75.3	ug/L	7.23	24.1
108-60-1	bis(2-Chloro-1-methylethyl)ether		95.6	ug/L	7.23	24.1
111-91-1	bis(2-Chloroethoxy)methane		101	ug/L	7.23	24.1
111-44-4	bis(2-Chloroethyl) ether		95.4	ug/L	7.23	24.1
117-81-7	bis(2-Ethylhexyl)phthalate		101	ug/L	7.23	24.1

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

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<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203803339	<b>Date Received:</b> 06/02/2017 12:00	
<b>Client Sample:</b> QC for batch 1670792	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1670793	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/05/2017 14:23	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/05/2017 04:55	<b>Aliquot:</b> 415 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060517.B\s3f0510.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		111	ug/L	8.92	24.1
99-09-2	3-Nitroaniline		112	ug/L	7.23	24.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		92.3	ug/L	7.23	24.1
88-74-4	2-Nitroaniline		96.1	ug/L	7.23	24.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		101	ug/L	7.23	24.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	216	241	ug/L	90	(32%-124%)
2-Fluorobiphenyl	98.1	120	ug/L	81	(32%-112%)
2-Fluorophenol	160	241	ug/L	67	(15%-88%)
Nitrobenzene-d5	104	120	ug/L	86	(36%-115%)
Phenol-d5	127	241	ug/L	53	(15%-91%)
p-Terphenyl-d14	110	120	ug/L	91	(36%-121%)

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 05-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> SEMIOVA GC/MS	<b>Test / Method:</b> SW846 3510C/8270D	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1670793	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633)</b> <b>Application Issues:</b> Failed RPD for MS/MSD, or PS/PSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for MS/MSD, or PS/PSD: QC 1203803339MSD		1. The relative percent difference (RPD) between the MS and MSD (See Below) did not meet acceptance limits. As the individual MS and MSD recoveries were within the acceptance limits, the failures had no adverse impact on the reported sample data. 1203803338MS and 1203803339MSD (CAWA-17-134191) Benzidine [100* (0%-30%)] and Pyridine [55* (0%-30%)].	

**Originator's Name:**

Josh Brooks 05-JUN-17

**Data Validator/Group Leader:**

Cameron Bearden 06-JUN-17

# **Perchlorates by LCMSMS Analysis**



# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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: 1670986

Prep Batch Number: 1670985

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
424596002	424596002 (CAWA-17-133306)
424596003	424596003 (CAWA-17-133334)
424596007	424596007 (CAWA-17-134191)
424596010	424596010 (CAWA-17-133316)
1203803792	Interference Check Sample (ICS)
1203803788	Method Blank (MB)
1203803789	Laboratory Control Sample (LCS)
1203803790	423831001(CAMO-17-132215) Matrix Spike (MS)
1203803791	423831001(CAMO-17-132215) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

## **Calibration Information**

### **Initial Calibration**

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

### **ICV Requirements**

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

### **CCB Requirements**

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

### **CCV Requirements**

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

### **Low Level Standard (CRI) Requirements**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The ICS spike recoveries met the acceptance criteria.

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

The LCS spike recoveries met the acceptance limits.

### **QC Sample Designation**

Client sample 423831001 (CAMO-17-132215) 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**

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

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

##### **Manual Integrations**

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: 2017-1633 GEL Work Order: 424596

#### 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: 06 JUN 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133306Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596002Date Filtered: 05-JUN-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	0.383	ug/L		1	05-JUN-17 20:29	per0605026a
	Perchlorate Isotope Ratio			2.75			1	05-JUN-17 20:29	per0605026a
14797-73-0	Perchlorate-101	.05	.2	0.409	ug/L		1	05-JUN-17 20:29	per0605026a
	Perchlorate-O(18)			0.536	ug/L		1	05-JUN-17 20:29	per0605026a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133334Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596003Date Filtered: 05-JUN-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	0.388	ug/L		1	05-JUN-17 20:38	per0605027a
	Perchlorate Isotope Ratio			2.73			1	05-JUN-17 20:38	per0605027a
14797-73-0	Perchlorate-101	.05	.2	0.417	ug/L		1	05-JUN-17 20:38	per0605027a
	Perchlorate-O(18)			0.504	ug/L		1	05-JUN-17 20:38	per0605027a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-134191Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596007Date Filtered: 05-JUN-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	0.200	ug/L	U	1	05-JUN-17 20:47	per0605028a
	Perchlorate Isotope Ratio						1	05-JUN-17 20:47	per0605028a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	05-JUN-17 20:47	per0605028a
	Perchlorate-O(18)			0.514	ug/L		1	05-JUN-17 20:47	per0605028a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133316Date Received: 02-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 424596010Date Filtered: 05-JUN-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	0.430	ug/L		1	05-JUN-17 20:56	per0605029a
	Perchlorate Isotope Ratio			2.7			1	05-JUN-17 20:56	per0605029a
14797-73-0	Perchlorate-101	.05	.2	0.467	ug/L		1	05-JUN-17 20:56	per0605029a
	Perchlorate-O(18)			0.512	ug/L		1	05-JUN-17 20:56	per0605029a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

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

# **Quality Control Summary**

**Perchlorate Laboratory Control Sample**

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2017-1633

**Extract Batch Code:** 1670985

**Date Filtered:** 05-JUN-17

**Matrix:** WATER

**Sample ID:** 1203803789

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		2.79				-
Perchlorate-101	0.200	.207	ug/L	104		85 - 115
Perchlorate-O(18)		.469	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

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**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2017-1633

**Extract Batch Code:** 1670985

**Date Extracted:** 05-JUN-17

**GEL MS/PS ID:** 1203803790

**Client ID:** CAMO-17-132215

**GEL MSD/PSD ID:** 1203803791

**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	0.346	ug/L	0.527	91	.514	84	2	30	75 - 125
Perchlorate Isotope Ratio	0	2.75		2.83		2.91		3		-
Perchlorate-101	0.200	0.369	ug/L	0.546	89	.519	75	5	30	75 - 125
Perchlorate-O(18)	0	0.480	ug/L	0.515		.517		0		-

^ 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: 05-JUN-17Instrument: LCMSMSGEL Job No (SDG): 2017-1633Method: EPA 6850 ModifiedGEL Sample ID: 1203803788Matrix: WATERDate Filtered: 05-JUN-17Extraction Batch ID: 1670985Injection 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	0.200	ug/L	U	1	05-JUN-17 18:32	per0605013a
	Perchlorate Isotope Ratio						1	05-JUN-17 18:32	per0605013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	05-JUN-17 18:32	per0605013a
	Perchlorate-O(18)			0.483	ug/L		1	05-JUN-17 18:32	per0605013a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 05-JUN-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803789Date Filtered: 05-JUN-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	0.197	ug/L	J	1	05-JUN-17 18:41	per0605014a
	Perchlorate Isotope Ratio			2.79			1	05-JUN-17 18:41	per0605014a
14797-73-0	Perchlorate-101	.05	.2	0.207	ug/L		1	05-JUN-17 18:41	per0605014a
	Perchlorate-O(18)			0.469	ug/L		1	05-JUN-17 18:41	per0605014a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803792Date Filtered: 05-JUN-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	0.190	ug/L	J	1	05-JUN-17 18:50	per0605015a
	Perchlorate Isotope Ratio			2.71			1	05-JUN-17 18:50	per0605015a
14797-73-0	Perchlorate-101	.05	.2	0.205	ug/L		1	05-JUN-17 18:50	per0605015a
	Perchlorate-O(18)			0.512	ug/L		1	05-JUN-17 18:50	per0605015a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132215MSDate Received: 23-MAY-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803790Date Filtered: 05-JUN-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	0.527	ug/L		1	05-JUN-17 19:08	per0605017a
	Perchlorate Isotope Ratio			2.83			1	05-JUN-17 19:08	per0605017a
14797-73-0	Perchlorate-101	.05	.2	0.546	ug/L		1	05-JUN-17 19:08	per0605017a
	Perchlorate-O(18)			0.515	ug/L		1	05-JUN-17 19:08	per0605017a

^ 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: 1670985Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-17-132215MSDDate Received: 23-MAY-17GEL Job No (SDG): 2017-1633GEL Sample ID: 1203803791Date Filtered: 05-JUN-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	0.514	ug/L		1	05-JUN-17 19:17	per0605018a
	Perchlorate Isotope Ratio			2.91			1	05-JUN-17 19:17	per0605018a
14797-73-0	Perchlorate-101	.05	.2	0.519	ug/L		1	05-JUN-17 19:17	per0605018a
	Perchlorate-O(18)			0.517	ug/L		1	05-JUN-17 19:17	per0605018a

^ When the analyte name is Perchlorate Isotope Ratio the concentration is a unitless value calculated from the ratio of Perchlorate peak area to Perchlorate-101 peak area. The Perchlorate-101 and isotopic ratio results are provided for qualitative purposes only. The results are used to verify the presence and quantitation of Perchlorate.

\*Concentration =

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

# **Explosives by LCMSMS Analysis**

# Case Narrative

**Explosives by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**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: 1671746

Prep Batch Number: 1671745

**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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) 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 calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB) and 424596007 (CAWA-17-134191) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

**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**

One or more of the required spiking analytes were not within the acceptance limits in the laboratory control sample (See Below). While the LCS exhibited a high bias, the analyte was/were not detected in the associated samples, the data are reported.

Sample	Analyte	Value
1203805556 (LCS)	2,6-Dinitrotoluene	106* (72%-105%)
	TATB	150* (47%-135%)

**QC Sample Designation**

Client sample 424596009 (CAWA-17-133288) was chosen for matrix spike and matrix spike duplicate analysis.

**Matrix Spike (MS) Recovery Statement**

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. Because the recoveries were biased high and target analytes were not detected in the associated samples above the reporting limit, the data were reported.

Sample	Analyte	Value
1203805560 (CAWA-17-133288MSD)	TATB	152* (38%-149%)

**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.

#### **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. Sample 424596009 (CAWA-17-133288) was further diluted to bring the over range concentration within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

	<b>424596</b>
Analyte	<b>009</b>
RDX	10X

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

1203805556 (LCS), 1203805559 (CAWA-17-133288MS), 1203805560 (CAWA-17-133288MSD), 424596001 (CAWA-17-133278), 424596004 (CAWA-17-133336) and 424596009 (CAWA-17-133288) were re-analyzed due to the bracketing CCV failing to meet the required acceptance criteria. The second analysis was bracketed by passing acceptance criteria.

#### **Miscellaneous Information**

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

Data exception report (DER) 1641799 was generated for samples 1203805556 (LCS) and 1203805560 (CAWA-17-133288MSD) in this SDG/batch.

##### **Manual Integrations**

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

##### **Additional Comments**

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

##### **System Configuration**

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

##### **Electronic Packaging Comment**

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and

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

#### **Chromatographic Columns**

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

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

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

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

#### 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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- 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 JUN 2017

Title: Group Leader

# Sample Data Summary

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133278

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596001

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608054.wiff

Date Analyzed: 10-JUN-17 00:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.234	J	0.086	0.269
80251-29-2	DNX				
5755-27-1	MNX	.246	J	0.086	0.269
5755-27-1	MNX				
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
121-14-2	2,4-Dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
19406-51-0	4-Amino-2,6-dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
35572-78-2	2-Amino-4,6-dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
99-08-1	m-Nitrotoluene				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
99-65-0	m-Dinitrobenzene				
13980-04-6	TNX	.322		0.086	0.269
13980-04-6	TNX				
479-45-8	Tetryl	.538	U	0.086	0.538
479-45-8	Tetryl				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133278

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596001

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.538	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	.835		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
3058-38-6	TATB	1.08	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
99-35-4	1,3,5-Trinitrobenzene	1.54		0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	6.49		0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133336

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596004

Sample Amount 900 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608055.wiff

Date Analyzed: 10-JUN-17 00:47

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.235	J	0.0889	0.278
5755-27-1	MNX				
80251-29-2	DNX	.259	J	0.0889	0.278
80251-29-2	DNX				
118-96-7	2,4,6-Trinitrotoluene	.278	U	0.0889	0.278
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.278	U	0.0889	0.278
121-14-2	2,4-Dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	.278	U	0.0889	0.278
19406-51-0	4-Amino-2,6-dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	.278	U	0.0889	0.278
35572-78-2	2-Amino-4,6-dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.278	U	0.0889	0.278
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.278	U	0.0911	0.278
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.278	U	0.0889	0.278
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.278	U	0.0889	0.278
99-08-1	m-Nitrotoluene				
99-65-0	m-Dinitrobenzene	.278	U	0.0889	0.278
99-65-0	m-Dinitrobenzene				
13980-04-6	TNX	.344		0.0889	0.278
13980-04-6	TNX				
479-45-8	Tetryl	.556	U	0.0889	0.556
479-45-8	Tetryl				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133336

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596004

Sample Amount 900 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.556	U	0.111	0.556
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.556	U	0.167	0.556
99-99-0	p-Nitrotoluene				
2691-41-0	HMX	.892		0.0889	0.278
2691-41-0	HMX				
3058-38-6	TATB	1.11	U	0.333	1.11
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.11	U	0.333	1.11
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.11	U	0.333	1.11
78-30-8	tris(o-cresyl) phosphate				
99-35-4	1,3,5-Trinitrobenzene	1.51		0.0889	0.278
99-35-4	1,3,5-Trinitrobenzene				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.78	U	0.556	2.78
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.78	U	0.556	2.78
6629-29-4	2,4-Diamino-6-nitrotoluene				
121-82-4	RDX	6.77		0.0889	0.278
121-82-4	RDX				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-134191

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596007

Sample Amount 910 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608033.wiff

Date Analyzed: 09-JUN-17 11:55

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.275	U	0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.275	U	0.0879	0.275
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.275	U	0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.275	U	0.0879	0.275
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.275	U	0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.275	U	0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.275	U	0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.275	U	0.0879	0.275
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.275	U	0.0879	0.275
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.275	U	0.0879	0.275
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.275	U	0.0901	0.275
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.275	U	0.0879	0.275
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.275	U	0.0879	0.275
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-134191

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596007

Sample Amount 910 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.275	U	0.0879	0.275
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.275	U	0.0879	0.275
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.549	U	0.0879	0.549
479-45-8	Tetryl				
78-11-5	PETN	.549	U	0.110	0.549
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.549	U	0.165	0.549
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1.1	U	0.330	1.10
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.1	QU	0.330	1.10
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.1	U	0.330	1.10
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.75	U	0.549	2.75
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.75	U	0.549	2.75
6629-29-4	2,4-Diamino-6-nitrotoluene				

1  
**High Explosives Analysis Data Sheet**

**Lab Name:** GEL Laboratories LLC

**Client Sample ID:** CAWA-17-133288

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1633

**Matrix:** WATER

**GEL Sample ID:** 424596009

**Sample Amount** 930 mL

**Date Received:** 02-JUN-17

**Moisture:** .

**Extraction Batch ID:** 1671745

**Extraction Type** Sol Exchange

**Date Extracted:** 07-JUN-17

**Concentrated Extract Volume (mL)** 5

**Injection Volume (uL):**50

**GEL data file:** EXP0608056.wiff

**Date Analyzed:** 10-JUN-17 01:22

**Dilution Factor:** 10

**Concentration Units:** ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	20.8		0.430	1.34
121-82-4	RDX				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596009

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608057.wiff

Date Analyzed: 10-JUN-17 01:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6 <i>13980-04-6</i>	TNX <i>TNX</i>	.0863	J	0.086	0.269
118-96-7 <i>118-96-7</i>	2,4,6-Trinitrotoluene <i>2,4,6-Trinitrotoluene</i>	.0975	J	0.086	0.269
5755-27-1 <i>5755-27-1</i>	MNX <i>MNX</i>	.166	J	0.086	0.269
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	.269	U	0.086	0.269
606-20-2 <i>606-20-2</i>	2,6-Dinitrotoluene <i>2,6-Dinitrotoluene</i>	.269	U	0.086	0.269
80251-29-2 <i>80251-29-2</i>	DNX <i>DNX</i>	.269	U	0.086	0.269
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	.269	U	0.0882	0.269
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	.269	U	0.086	0.269
99-08-1 <i>99-08-1</i>	m-Nitrotoluene <i>m-Nitrotoluene</i>	.269	U	0.086	0.269
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	.269	U	0.086	0.269
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	.269	U	0.086	0.269
35572-78-2 <i>35572-78-2</i>	2-Amino-4,6-dinitrotoluene <i>2-Amino-4,6-dinitrotoluene</i>	.342		0.086	0.269
19406-51-0 <i>19406-51-0</i>	4-Amino-2,6-dinitrotoluene <i>4-Amino-2,6-dinitrotoluene</i>	.446		0.086	0.269

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 424596009

Sample Amount 930 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	.538	U	0.086	0.538
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	.538	U	0.108	0.538
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	.538	U	0.161	0.538
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	1.08	U	0.323	1.08
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	1.08	U	0.323	1.08
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	1.08	U	0.323	1.08
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	1.69		0.086	0.269
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	2.69	U	0.538	2.69
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	2.69	U	0.538	2.69

# **Quality Control Summary**

## High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2017-1633Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424596001	CAWA-17-133278	90	55 - 115	
424596004	CAWA-17-133336	85	55 - 115	
424596007	CAWA-17-134191	89	55 - 115	
424596009	CAWA-17-133288DL	97	55 - 115	
424596009	CAWA-17-133288	79	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

**3B**  
**High Explosives LCS/LCS Duplicate Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1633

**Extract Batch Code:** 1671745

**Date Extracted:** 07-JUN-17

**GEL LCS ID:** 1203805556

**GEL LCSDUP ID:** .

**Analysis Date/Time:** 09-JUN-17 23:37

**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
HMX	5	3.92	78					58 - 113
Nitrobenzene	5	4.52	90					64 - 115
PETN	5	4.8	96					57 - 126
RDX	5	4	80					64 - 117
TATB	2.5	3.76	150 *					47 - 135
Tetryl	5	4.01	80					55 - 122
m-Dinitrobenzene	5	4.66	93					74 - 117
o-Nitrotoluene	5	4.49	90					64 - 115
p-Nitrotoluene	5	4.84	97					66 - 127
tris(o-cresyl) phosphate	5	3.64	73					43 - 104
m-Nitrotoluene	5	4.63	93					66 - 114
1,3,5-Trinitrobenzene	5	4.19	84					70 - 110
2,4,6-Trinitrotoluene	5	4.89	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	3.93	79					50 - 121
2,4-Dinitrotoluene	5	4.41	88					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.21	84					53 - 127
2,6-Dinitrotoluene	5	5.31	106 *					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.52	90					70 - 112
3,5-Dinitroaniline	5	6.02	120					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.76	95					74 - 116

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

\* Values outside of QC limits



**3**  
**High Explosives MS/MSD Summary**

**Lab Name:** GEL Laboratories LLC

**Client ID:** CAWA-17-133288

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1633

**Extract Batch Code:** 1671745

**Date Extracted:** 07-JUN-17

**GEL Spike ID:** 1203805559

**GEL SpikeDup ID:** 1203805560

**Analysis Date/Time:** 10-JUN-17 02:32

**MSD Analysis Date/Time:** 10-JUN-17 03:07

**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
HMX	5.20833	1.69	6.44	91	6.47	92	1	30	44 - 128
Nitrobenzene	5.20833	0	4.27	82	4	77	6	30	62 - 116
PETN	5.20833	0	4.52	87	4.21	81	7	30	51 - 131
RDX	5.20833	21.2	26.4	100	22.2	20 *	17	30	57 - 125
TATB	2.60417	0	3.88	149	3.97	152 *	2	30	38 - 149
Tetryl	5.20833	0	3.82	73	3.79	73	1	30	50 - 126
m-Dinitrobenzene	5.20833	0	4.93	95	4.53	87	8	30	74 - 117
m-Nitrotoluene	5.20833	0	4.09	78	3.95	76	3	30	59 - 120
o-Nitrotoluene	5.20833	0	4.64	89	4.01	77	15	30	56 - 119
p-Nitrotoluene	5.20833	0	4.8	92	4.24	81	12	30	61 - 129
tris(o-cresyl) phosphate	5.20833	0	3.68	71	3.71	71	1	30	38 - 105
1,3,5-Trinitrobenzene	5.20833	0	4.34	83	4.11	79	5	30	67 - 111
2,4,6-Trinitrotoluene	5.20833	.0975	4.56	86	4.59	86	0	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.20833	0	5.74	110	6.16	118	7	30	50 - 121
2,4-Dinitrotoluene	5.20833	.0404	4.61	88	5.19	99	12	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.20833	0	5.42	104	5.58	107	3	30	53 - 127
2,6-Dinitrotoluene	5.20833	0	4.49	86	4.26	82	5	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.20833	.342	4.46	79	4.7	84	5	30	67 - 115
3,5-Dinitroaniline	5.20833	.103	5.81	110	5.72	108	2	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.20833	.446	4.76	83	5.32	94	11	30	65 - 120

#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 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	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 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.5	U	0.080	0.500
479-45-8	Tetryl				
78-11-5	PETN	.5	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1	QU	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	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 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.64		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
3058-38-6	TATB	3.76		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
2691-41-0	HMX	3.92		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.93		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	4		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
479-45-8	Tetryl	4.01		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
99-35-4	1,3,5-Trinitrobenzene	4.19		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.21		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.41		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.49		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	4.52		0.080	0.250
35572-78-2	2-Amino-4,6-dinitrotoluene				
98-95-3	Nitrobenzene	4.52		0.080	0.250
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	4.63		0.080	0.250
99-08-1	m-Nitrotoluene				
99-65-0	m-Dinitrobenzene	4.66		0.080	0.250
99-65-0	m-Dinitrobenzene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.080	0.250
19406-51-0	4-Amino-2,6-dinitrotoluene				
78-11-5	PETN	4.8		0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	4.84		0.150	0.500
99-99-0	p-Nitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	4.89		0.080	0.250
118-96-7	2,4,6-Trinitrotoluene				
606-20-2	2,6-Dinitrotoluene	5.31		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
618-87-1	3,5-Dinitroaniline	6.02		0.300	1.00
618-87-1	3,5-Dinitroaniline				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.0885	J	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.175	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.68		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.82		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
3058-38-6	TATB	3.88		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
99-08-1	m-Nitrotoluene	4.09		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.27		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.34		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.46		0.0833	0.260
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.49		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
78-11-5	PETN	4.52		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
118-96-7	2,4,6-Trinitrotoluene	4.56		0.0833	0.260
<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: CAWA-17-133288(424596009MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.61		0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.64		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.0833	0.260
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.8		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.93		0.0833	0.260
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.42		0.521	2.60
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.74		0.521	2.60
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.81		0.313	1.04
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
2691-41-0	HMX	6.44		0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	26.4		0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.164	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.26	U	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.71		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.79		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
99-08-1	m-Nitrotoluene	3.95		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
3058-38-6	TATB	3.97		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
98-95-3	Nitrobenzene	4		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.01		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.11		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
78-11-5	PETN	4.21		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.24		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.26		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133288(424596009MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1633

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 02-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.53		0.0833	0.260
99-65-0	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.59		0.0833	0.260
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.7		0.0833	0.260
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.19		0.0833	0.260
121-14-2	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.32		0.0833	0.260
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.58		0.521	2.60
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.72		0.313	1.04
618-87-1	<i>3,5-Dinitroaniline</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.16		0.521	2.60
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	6.47		0.0833	0.260
2691-41-0	<i>HMX</i>				
121-82-4	RDX	22.2		0.0833	0.260
121-82-4	<i>RDX</i>				

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1633Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
TATB	0	0
3,5-Dinitroaniline	0	0

4A  
Explosives Continuing Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 08-JUN-17 22:28

**GEL Data File:** EXP0608010.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	7.06
3,4-Dinitrotoluene	0	3.64
tris(o-cresyl) phosphate	0	4.72
TATB	0	0
3,5-Dinitroaniline	0	3.86
2,4-Diamino-6-nitrotoluene	0	4.19
2,6-Diamino-4-nitrotoluene	0	4.27
DNX	0	0
MNX	0	0
TNX	0	3.53
1,3,5-Trinitrobenzene	0	3.75
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	4
2-Amino-4,6-dinitrotoluene	0	3.41
4-Amino-2,6-dinitrotoluene	0	3.74
HMX	0	0
Nitrobenzene	0	1.42
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

**Analysis Date:** 09-JUN-17 00:49

**GEL Data File:** EXP0608014.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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	3.17

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 09-JUN-17 04:54

**GEL Data File:** EXP0608021.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
MXN	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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 09-JUN-17 07:15

GEL Data File: EXP0608025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 09-JUN-17 08:25

GEL Data File: EXP0608027.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 09-JUN-17 14:51

**GEL Data File:** EXP0608038.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	2.44
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 09-JUN-17 16:01

GEL Data File: EXP0608040.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
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): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 09-JUN-17 22:27

GEL Data File: EXP0608051.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1633

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 10-JUN-17 03:42

**GEL Data File:** EXP0608060.wiff

**Instrument ID:** LCMSMS5

**Column:** Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	2.54
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1633

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
3,4-Dinitrotoluene	0	0

# Miscellaneous



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 14-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LC-MS/MS	<b>Test / Method:</b> SW846 3535A/8330B	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1671746	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633),424732(2017-1648),424735(2017-1647),424739(2017-1645),424741(2017-1644)</b> <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD Failed Recovery for LCS/LCSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Two high recoveries were observed for 1203805556 (LCS). The recovery for 2,6-Dinitrotoluene was 106% (72%-105%) and for TATB, the recovery was 150% (47-135%).  2. A high recovery was observed for 1203805559 (MS). The recovery for TATB was 152% (38%-149%).		1. The high recoveries may be the result of vagaries in the extraction process and would suggest bias high detections. No reportable detections were observed in the associated samples.  2. The high recovery may be the result of vagaries in the extraction process. The high recovery was also observed in the batch LCS. No reportable detections were observed in the associated samples.	

**Originator's Name:**

Charles Wilson 14-JUN-17

**Data Validator/Group Leader:**

Michael Penny 14-JUN-17

# PCB Analysis

# Case Narrative

**GC Semivolatile PCB  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD

Analytical Method: SW846 3535A/8082

Prep Method: SW846 3535A

Analytical Batch Number: 1672047

Prep Batch Number: 1672046

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

<b>Sample ID</b>	<b>Client ID</b>
424596005	CAWA-17-134191
1203806423	Method Blank (MB)
1203806424	Laboratory Control Sample (LCS)
1203806429	Laboratory Control Sample Duplicate (LCSD)
1203806425	423945001(WST35-17-135775) Matrix Spike (MS)

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-040 REV# 24.

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

**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.

**Initial Calibration**

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

**Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were

within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

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

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

An LCSD analysis was performed for this batch of the samples.

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

The LCS/LCSD spike recoveries met the acceptance limits.

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

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

#### **QC Sample Designation**

Sample 423945001 (WST35-17-135775) was selected for the matrix spike analysis.

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

The MS/MSD recoveries were within the established acceptance limits.

### **Technical Information**

#### **Holding Time Specifications**

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

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

All samples and QC in this batch were cleaned using alumina in order to remove oil and other high molecular weight interferences. All samples and QC in this batch were cleaned with activated copper in order to remove sulfur. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

#### **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 for the samples reported in this batch.

### **Miscellaneous Information**

#### **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. 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.

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

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

#### **Manual integrations**

Manual integrations were not required for samples and QC samples associated with this SDG in this batch.

#### **Additional Comments**

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

#### **System Configuration**

The Semi-Volatiles-PCB 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>
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1633 GEL Work Order: 424596

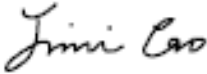
#### The Qualifiers in this report are defined as follows:

- \* 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: Jimin Cao

Date: 09 JUN 2017

Title: Data Validator

# Sample Data Summary



**PCB**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424596005	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> PCB	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134191	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 11:30	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 900 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0929.D	<b>Column:</b> 1 RTX-CLPEST 1	
060917.S\E9f0929.D	2 RTX-CLPEST 2	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.111	ug/L	0.037	0.111	1
11104-28-2	Aroclor-1221	U	0.111	ug/L	0.037	0.111	1
11141-16-5	Aroclor-1232	U	0.111	ug/L	0.037	0.111	1
53469-21-9	Aroclor-1242	U	0.111	ug/L	0.037	0.111	1
12672-29-6	Aroclor-1248	U	0.111	ug/L	0.037	0.111	1
11097-69-1	Aroclor-1254	U	0.111	ug/L	0.037	0.111	1
11096-82-5	Aroclor-1260	U	0.111	ug/L	0.037	0.111	1
37324-23-5	Aroclor-1262	U	0.111	ug/L	0.037	0.111	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.137	0.222	ug/L	62 (33%-122%)
Decachlorobiphenyl	0.198	0.222	ug/L	89 (35%-138%)

# **Quality Control Summary**

---

**PCB**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2017-1633****Matrix Type: LIQUID**

---

Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203806423	MB for batch 1672046	55	60	81	88
1203806424	LCS for batch 1672046	61	67	87	94
1203806429	LCSD for batch 1672046	65	71	91	98
1203806425	WST35-17-135775MS	60	64	88	95
424596005	CAWA-17-134191	62	67	89	95

---

**Surrogate****Acceptance Limits**

4CMX = 4cmx (33%-122%)

DCB = Decachlorobiphenyl (35%-138%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1672046

Matrix: WATER

Lab Sample ID 1203806424

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:22

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	LCS Aroclor-1016	1.00	0.0	0.668	67	45-101
11096-82-5	LCS Aroclor-1260	1.00	0.0	0.647	65	52-113

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 2 of 2

SDG Number: 2017-1633

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1672046

Matrix: WATER

Lab Sample ID 1203806429

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:34

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
12674-11-2	LCSD Aroclor-1016	1.00	0.0	0.715	72	45-101	7	0-26
11096-82-5	LCSD Aroclor-1260	1.00	0.0	0.719	72	52-113	11	0-26

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2017-1633

Sample Type: Matrix Spike

Client ID: WST35-17-135775MS

Matrix: W

Lab Sample ID 1203806425

Instrument: ECD9A.I

Analysis Date: 06/09/2017 09:13

Dilution: 1

Analyst: YS1

Prep Batch ID:1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	MS Aroclor-1016	1.28	0.00 U	0.882	69	26-110
11096-82-5	MS Aroclor-1260	1.28	0.00 U	0.866	68	30-127

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1633	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1672046	Instrument ID:	ECD9A.I_1	Data File:	060917.S\E9f0914.D
Lab Sample ID:	1203806423		ECD9A.I_2		060917.S\E9f0914.D
Column:	RTX-CLPEST 1	Prep Date:	06/08/2017 09:15	Analyzed:	06/09/17 08:10
	RTX-CLPEST 2				

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 1672046	1203806424	060917.S\E9f0915.D	06/09/17	0822
02 LCSD for batch 1672046	1203806429	060917.S\E9f0916.D	06/09/17	0834
03 WST35-17-135775MS	1203806425	060917.S\E9f0919.D	06/09/17	0913
04 CAWA-17-134191	424596005	060917.S\E9f0929.D	06/09/17	1130

# Quality Control Data



**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203806423  
**Client Sample:** QC for batch 1672046  
**Client ID:** MB for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:10  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0914.D  
 060917.S\E9f0914.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.100	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260	U	0.100	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.109	0.200	55	(33%-122%)
Decachlorobiphenyl	0.162	0.200	81	(35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1633  
**Lab Sample ID:** 1203806424  
**Client Sample:** QC for batch 1672046  
**Client ID:** LCS for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:22  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0915.D  
 060917.S\E9f0915.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.668	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.647	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.122	0.200	61	(33%-122%)
Decachlorobiphenyl	0.175	0.200	87	(35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2017-1633	<b>Date Collected:</b> 05/22/2017 09:47	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203806425	<b>Date Received:</b> 05/24/2017 09:10	
<b>Client Sample:</b> QC for batch 1672046	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> WST35-17-135775MS	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 09:13	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 780 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0919.D	<b>Column:</b> 1 RTX-CLPEST 1	
060917.S\E9f0919.D	2 RTX-CLPEST 2	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.882	ug/L	0.0427	0.128	1
11104-28-2	Aroclor-1221	U	0.128	ug/L	0.0427	0.128	1
11141-16-5	Aroclor-1232	U	0.128	ug/L	0.0427	0.128	1
53469-21-9	Aroclor-1242	U	0.128	ug/L	0.0427	0.128	1
12672-29-6	Aroclor-1248	U	0.128	ug/L	0.0427	0.128	1
11097-69-1	Aroclor-1254	U	0.128	ug/L	0.0427	0.128	1
11096-82-5	Aroclor-1260		0.866	ug/L	0.0427	0.128	1
37324-23-5	Aroclor-1262	U	0.128	ug/L	0.0427	0.128	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.153	0.256	ug/L	60 (33%-122%)
Decachlorobiphenyl	0.225	0.256	ug/L	88 (35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1633

Lab Sample ID: 1203806429

Client Sample: QC for batch 1672046

Client ID: LCSD for batch 1672046

Batch ID: 1672047

Run Date: 06/09/2017 08:34

Prep Date: 06/08/2017 09:15

Data File: 060917.S\E9f0916.D

060917.S\E9f0916.D

Client: ARSL004

Method: SW846 3535A/8082

Inst: ECD9A.I

Analyst: YS1

Aliquot: 1000 mL

Column: 1 RTX-CLPEST 1

2 RTX-CLPEST 2

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-040

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.715	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.719	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.130	0.200	65	(33%-122%)
Decachlorobiphenyl	0.182	0.200	91	(35%-138%)

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1633**  
**Work Order #: 424596**

<b>Sample ID</b>	<b>Client ID</b>
424596001	CAWA-17-133278
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
424596010	CAWA-17-133316
1203802986	Method Blank (MB) <b>ICP</b>
1203802987	Laboratory Control Sample (LCS)
1203802990	424596002(CAWA-17-133306L) Serial Dilution (SD)
1203802988	424596002(CAWA-17-133306D) Sample Duplicate (DUP)
1203802989	424596002(CAWA-17-133306S) Matrix Spike (MS)
1203803321	Method Blank (MB) <b>ICP-MS</b>
1203803322	Laboratory Control Sample (LCS)
1203803325	424596002(CAWA-17-133306L) Serial Dilution (SD)
1203803323	424596002(CAWA-17-133306D) Sample Duplicate (DUP)
1203803324	424596002(CAWA-17-133306S) Matrix Spike (MS)
1203810085	Method Blank (MB) <b>CVAA</b>
1203810086	Laboratory Control Sample (LCS)
1203810091	424596001(CAWA-17-133278L) Serial Dilution (SD)
1203810087	424596001(CAWA-17-133278D) Sample Duplicate (DUP)
1203810089	424596001(CAWA-17-133278S) Matrix Spike (MS)

**Sample Analysis**

Samples 424596001,002,003,004,007,009 and 010 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1670658, 1670784, 1673477 and 1677826
<b>Prep Batch :</b>	1670657, 1670783 and 1673474
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

## **Preparation/Analytical Method Verification**

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

## **System Configuration**

The Hardness as CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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. 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191) and 424596010 (CAWA-17-133316)-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: 424596002 (CAWA-17-133306)-ICP and ICP-MS and 424596001 (CAWA-17-133278)-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**

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

**Technical Information****Holding Time Specifications**

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The 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.

**Data Exception (DER) Documentation**

A data exception report was not required for this SDG.

**Additional Comments**

Total Hardness by Calculation is determined using the results of Total Calcium (Ca) and Total Magnesium (Mg) determined by ICP or ICP-MS.

$$\text{Hardness} = 2.497 (\text{Ca}) + 4.118 (\text{Mg})$$

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package. There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

**Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596

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

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

#### **Review/Validation**

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

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

**Signature:**



**Name: Nik-Cole Elmore**

**Date: 27 JUN 2017**

**Title: Data Validator**

# Sample Data Summary

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596001**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133278**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:08	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596002**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133306**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:17	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596002

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133306

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	352	ug/L		68	200	200	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:12	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-39-3	Barium	90.9	ug/L		1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-50-8	Copper	4.03	ug/L	J	3	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-89-6	Iron	147	ug/L		30	100	100	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7439-95-4	Magnesium	4590	ug/L		110	300	300	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7439-98-7	Molybdenum	0.445	ug/L	J	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-02-0	Nickel	1.57	ug/L	J	0.6	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-09-7	Potassium	2700	ug/L		50	150	150	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7631-86-9	Silica	36300	ug/L		53	213	213	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-23-5	Sodium	13100	ug/L		100	300	300	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-24-6	Strontium	89.7	ug/L		1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:15	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-61-1	Uranium	0.216	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:12	170622-3	1670784
7440-62-2	Vanadium	2.41	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:31	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:31	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596002**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133306**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.4	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596003**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133334**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:18	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596003

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133334

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	323	ug/L		68	200	200	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:18	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-39-3	Barium	92.7	ug/L		1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-70-2	Calcium	13800	ug/L		50	200	200	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-50-8	Copper	3.21	ug/L	J	3	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-89-6	Iron	138	ug/L		30	100	100	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7439-95-4	Magnesium	4630	ug/L		110	300	300	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7439-98-7	Molybdenum	0.416	ug/L	J	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-02-0	Nickel	1.55	ug/L	J	0.6	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-09-7	Potassium	2620	ug/L		50	150	150	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7631-86-9	Silica	37000	ug/L		53	213	213	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-23-5	Sodium	13100	ug/L		100	300	300	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-24-6	Strontium	88.9	ug/L		1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:31	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-61-1	Uranium	0.217	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:18	170622-3	1670784
7440-62-2	Vanadium	2.4	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:21	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:21	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596003**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133334**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.6	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596004**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133336**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:20	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596007**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-134191**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:25	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596007

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-134191

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:19	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-39-3	Barium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-70-2	Calcium	200	ug/L	U	50	200	200	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7439-95-4	Magnesium	300	ug/L	U	110	300	300	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7439-98-7	Molybdenum	0.50	ug/L	U	0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-09-7	Potassium	150	ug/L	U	50	150	150	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7631-86-9	Silica	213	ug/L	U	53	213	213	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-23-5	Sodium	300	ug/L	U	100	300	300	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-24-6	Strontium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:34	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:19	170622-3	1670784
7440-62-2	Vanadium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:24	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:24	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596007**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-134191**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	1.24	mg/L	U	0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596009**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133288**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:27	061417W1-4	1673477

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974



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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424596010**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133316**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:29	061417W1-4	1673477

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

SDG No: 2017-1633

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424596010

BASIS: As Received

DATE COLLECTED 31-MAY-17

CLIENT ID: CAWA-17-133316

LEVEL: Low

DATE RECEIVED 02-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/23/17 07:20	170622-3	1670784
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-39-3	Barium	5.08	ug/L		1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-42-8	Boron	34	ug/L	J	15	50	50	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-70-2	Calcium	13900	ug/L		50	200	200	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7439-95-4	Magnesium	4560	ug/L		110	300	300	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7439-98-7	Molybdenum	0.973	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-09-7	Potassium	1920	ug/L		50	150	150	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7631-86-9	Silica	46400	ug/L		53	213	213	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-23-5	Sodium	17000	ug/L		100	300	300	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-24-6	Strontium	87.2	ug/L		1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/21/17 23:38	170621-2	1670784
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-61-1	Uranium	0.624	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/23/17 07:20	170622-3	1670784
7440-62-2	Vanadium	1.94	ug/L	J	1	5	5	1	P	HSC	06/26/17 11:28	062617A-1	1670658
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/26/17 11:28	062617A-1	1670658

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

**SDG No:** 2017-1633**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424596010**BASIS:** As Received**DATE COLLECTED** 31-MAY-17**CLIENT ID:** CAWA-17-133316**LEVEL:** Low**DATE RECEIVED** 02-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	53.4	mg/L		0.453	1.24	1.24	1		TXT1	06/27/17 14:27		1677826

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1670658	1670657	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1670784	1670783	SW846 3005A	50	mL	50	mL	06/03/17	SXW1
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*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. 2017-1633

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>
1203802986	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
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
1203803321	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.134	ug/L	+/-0.2	J	MS	0.067	0.2
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596002 Spike ID: 1203802989

<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	5300		352		5000	98.9		P
Barium	ug/L	75-125	595		90.9		500	101		P
Beryllium	ug/L	75-125	501		1	U	500	100		P
Boron	ug/L	75-125	524		15	U	500	103		P
Calcium	ug/L	75-125	18800		13800		5000	99.8		P
Cobalt	ug/L	75-125	501		1	U	500	100		P
Copper	ug/L	75-125	522		4.03	J	500	104		P
Iron	ug/L	75-125	5370		147		5000	105		P
Magnesium	ug/L	75-125	9660		4590		5000	101		P
Manganese	ug/L	75-125	497		2	U	500	99.2		P
Potassium	ug/L	75-125	7560		2700		5000	97.2		P
Silica	ug/L	75-125	48200		36300		10700	111		P
Sodium	ug/L	75-125	18900		13100		5000	116		P
Strontium	ug/L	75-125	596		89.7		500	101		P
Tin	ug/L	75-125	506		2.5	U	500	101		P
Vanadium	ug/L	75-125	513		2.41	J	500	102		P
Zinc	ug/L	75-125	480		3.3	U	500	95.6		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596002 Spike ID: 1203803324

<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	49.7		1	U	50	99		MS
Arsenic	ug/L	75-125	53.5		2	U	50	104		MS
Cadmium	ug/L	75-125	48.6		0.3	U	50	97.2		MS
Chromium	ug/L	75-125	51.2		3	U	50	100		MS
Lead	ug/L	75-125	50.6		0.5	U	50	101		MS
Molybdenum	ug/L	75-125	50.5		0.445	J	50	100		MS
Nickel	ug/L	75-125	56.7		1.57	J	50	110		MS
Selenium	ug/L	75-125	50.2		2	U	50	100		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	47.4		0.6	U	50	94.5		MS
Uranium	ug/L	75-125	50.6		0.216		50	101		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1633 **Client ID:** CAWA-17-133278S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 424596001 **Spike ID:** 1203810089

<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**  
**-6-**  
**Duplicate Sample Summary**

SDG No.: 2017-1633

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133306D

Matrix: WATER

Level: Low

Sample ID: 424596002

Duplicate ID: 1203802988

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	352		318		9.93		P
Barium	ug/L	+/-20%	90.9		94.4		3.82		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	13800		14000		.971		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L	+/-10	4.03 J		4.02 J		.31		P
Iron	ug/L	+/-100	147		143		2.96		P
Magnesium	ug/L	+/-20%	4590		4640		1.16		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	2700		2670		1.03		P
Silica	ug/L	+/-20%	36300		37600		3.38		P
Sodium	ug/L	+/-20%	13100		13600		3.19		P
Strontium	ug/L	+/-20%	89.7		91.1		1.59		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	2.41 J		3.27 J		30		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2017-1633

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133306D

Matrix: WATER

Level: Low

Sample ID: 424596002

Duplicate ID: 1203803323

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		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.445 J		0.451 J		1.34		MS
Nickel	ug/L	+/- 2	1.57 J		1.49 J		5.36		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	+/- .2	0.216		0.21		2.82		MS

\*Analytical Methods:

MS SW846 3005A/6020A

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

**SDG No.:** 2017–1633**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–17–133278D**Matrix:** WATER**Level:** Low**Sample ID:** 424596001**Duplicate ID:** 1203810087**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

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1633

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>
1203802987								
	Aluminum	ug/L	5000	4780		95.7	80-120	P
	Barium	ug/L	500	486		97.3	80-120	P
	Beryllium	ug/L	500	480		96	80-120	P
	Boron	ug/L	500	490		98.1	80-120	P
	Calcium	ug/L	5000	4760		95.1	80-120	P
	Cobalt	ug/L	500	490		98.1	80-120	P
	Copper	ug/L	500	490		98	80-120	P
	Iron	ug/L	5000	4900		98	80-120	P
	Magnesium	ug/L	5000	4900		97.9	80-120	P
	Manganese	ug/L	500	485		97.1	80-120	P
	Potassium	ug/L	5000	4920		98.5	80-120	P
	Silica	ug/L	10700	10100		94.2	80-120	P
	Sodium	ug/L	5000	4940		98.9	80-120	P
	Strontium	ug/L	500	474		94.9	80-120	P
	Tin	ug/L	500	486		97.1	80-120	P
	Vanadium	ug/L	500	486		97.2	80-120	P
	Zinc	ug/L	500	464		92.8	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1633

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203803322								
	Antimony	ug/L	50	48.8		97.5	80-120	MS
	Arsenic	ug/L	50	51.9		104	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	48.8		97.6	80-120	MS
	Lead	ug/L	50	50.7		101	80-120	MS
	Molybdenum	ug/L	50	50.7		101	80-120	MS
	Nickel	ug/L	50	52.6		105	80-120	MS
	Selenium	ug/L	50	50.7		101	80-120	MS
	Silver	ug/L	50	51.8		104	80-120	MS
	Thallium	ug/L	50	47		94	80-120	MS
	Uranium	ug/L	50	48.9		97.8	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1633

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>
1203810086	Mercury	ug/L	2	2.04		102	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2017-1633 Client ID: CAWA-17-133306L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 424596002 Serial Dilution ID: 1203802990

<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	352		353	J	.344			P
Barium	90.9		92.8		2.107		10	P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	13800		13800		.423		10	P
Cobalt	1	U	5	U				P
Copper	4.03	J	15	U	23.705			P
Iron	147		163	J	11.239			P
Magnesium	4590		4520		1.577			P
Manganese	2	U	10	U				P
Potassium	2700		2810		4.172		10	P
Silica	36300		35800		1.545		10	P
Sodium	13100		13500		2.884		10	P
Strontium	89.7		92.3		2.967		10	P
Tin	2.5	U	12.5	U				P
Vanadium	2.41	J	5	U	29.942			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2017-1633

Client ID: CAWA-17-133306L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424596002

Serial Dilution ID: 1203803325

<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	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.445	J	1	U	25.843			MS
Nickel	1.57	J	3	U	17.939			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.216		.335	U	43.519			MS

## \*Analytical Methods:

MS SW846 3005A/6020A



## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2017-1633 **Client ID:** CAWA-17-133278L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424596001 **Serial Dilution ID:** 1203810091

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

## \*Analytical Methods:

AV EPA 245.1/245.2

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1670679

**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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203803827	Method Blank (MB)
1203803828	Laboratory Control Sample (LCS)
1203803830	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203803832	424596007(CAWA-17-134191) 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 424596007 (CAWA-17-134191) 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****Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1670760	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1670759	<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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203803257	Method Blank (MB)
1203803258	Laboratory Control Sample (LCS)
1203803259	424596001(CAWA-17-133278) Sample Duplicate (DUP)
1203803262	424596001(CAWA-17-133278) 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# 19.

### **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 424596001 (CAWA-17-133278) was 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 Preservation/Integrity**

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

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

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

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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



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

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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1670735

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203803175	Method Blank (MB)
1203803176	Laboratory Control Sample (LCS)
1203803177	424596010(CAWA-17-133316) Sample Duplicate (DUP)
1203803178	424596010(CAWA-17-133316) 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-1600 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 424596010 (CAWA-17-133316) was 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 following samples 1203803177 (CAWA-17-133316DUP), 1203803178 (CAWA-17-133316PS), 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334) and 424596010 (CAWA-17-133316) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	424596		
	002	003	010
Chloride	5X	5X	10X

**Sample Re-analysis**

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

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

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

**Manual Integrations**

Samples 1203803177 (CAWA-17-133316DUP), 1203803178 (CAWA-17-133316PS), 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191) and 424596010 (CAWA-17-133316) 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:** 1670372      **Method:** NH3  
**Prep Batch :** 1670371      **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203802234	Method Blank (MB)
1203802235	Laboratory Control Sample (LCS)
1203803278	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203803279	424596002(CAWA-17-133306) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-106 REV# 9.

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 424596002 (CAWA-17-133306) was 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 Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1670378	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1670377	<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>
424596001	CAWA-17-133278
424596004	CAWA-17-133336
424596007	CAWA-17-134191
424596009	CAWA-17-133288
1203802248	Method Blank (MB)
1203802249	Laboratory Control Sample (LCS)
1203803289	424596001(CAWA-17-133278) Sample Duplicate (DUP)
1203803290	424596001(CAWA-17-133278) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-104 REV# 14.

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

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

### **Calibration Information**

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

### **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 424596001 (CAWA-17-133278) 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, Total Kjeldahl	1203803290 (CAWA-17-133278MS)	79* (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 424596001 (CAWA-17-133278) and 424596007 (CAWA-17-134191) were re-analyzed due to instrument

failure. The results from the reanalysis are reported.

### **Miscellaneous Information**

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

A data exception report (DER) 1640084 was generated for sample 1203803290 (CAWA-17-133278MS) in this SDG/batch.

#### **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:

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### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1670096

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203801609	Method Blank (MB)
1203801610	Laboratory Control Sample (LCS)
1203801611	424151005(CASA-17-132988) Sample Duplicate (DUP)
1203801613	424151005(CASA-17-132988) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **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 424151005 (CASA-17-132988) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1670383	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1670381	<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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203802258	Method Blank (MB)
1203802259	Laboratory Control Sample (LCS)
1203803294	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203803295	424596002(CAWA-17-133306) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **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 424596002 (CAWA-17-133306) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1671087

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203804101	Method Blank (MB)
1203804102	Laboratory Control Sample (LCS)
1203804103	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203804104	424596003(CAWA-17-133334) 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**

Samples 424596002 (CAWA-17-133306) and 424596003 (CAWA-17-133334) were 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	1203804103 (CAWA-17-133306DUP)	10.1* (0%-5%)
	1203804104 (CAWA-17-133334DUP)	17.1* (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****Data Exception (DER) Documentation**

A data exception report (DER) 1640653 was generated for samples 1203804103 (CAWA-17-133306DUP) and 1203804104 (CAWA-17-133334DUP) in this SDG/batch.

**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:** 1671823

**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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Initial Standardization**

The titrant was properly standardized

#### **Calibration Verification Information**

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

### **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 424596002 (CAWA-17-133306) and 424747001 (CAWA-17-133332) were selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1671988 **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424596002 (CAWA-17-133306) was selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596002 (CAWA-17-133306)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596003 (CAWA-17-133334)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596007 (CAWA-17-134191)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424596010 (CAWA-17-133316)	pH	Received 02-JUN-17, out of holding 31-MAY-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****Data Exception (DER) Documentation**

A data exception report (DER) 1640886 was generated for samples 424596002 (CAWA-17-133306), 424596003 (CAWA-17-133334), 424596007 (CAWA-17-134191), 424596010 (CAWA-17-133316) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

**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:** 1671987      **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>
424596002	CAWA-17-133306
424596003	CAWA-17-133334
424596007	CAWA-17-134191
424596010	CAWA-17-133316
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

The Titration and Ion analysis was performed on a Electronic bottle-top buret.

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424747001 (CAWA-17-133332) 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**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Certification Statement**

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

## **GEL LABORATORIES LLC**

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### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596


#### **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:** 22 JUN 2017

**Title:** Analyst I

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133278  
Sample ID: 424596001  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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		1.98	0.330	1.00	mg/L		1	TSM	06/10/17	0124	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0842	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1446	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133306  
Sample ID: 424596002  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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	MXL2	06/03/17	0917	1670735	1
Fluoride	J	0.0812	0.033	0.100	mg/L		1					
Sulfate		7.60	0.133	0.400	mg/L		1					
Chloride		21.1	0.335	1.00	mg/L		5	MXL2	06/05/17	1633	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0929	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0950	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.673	0.017	0.050	mg/L		1	AXH3	06/05/17	0856	1670096	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.039	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1137	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		149	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		46.2	1.45	4.00	mg/L			RXB5	06/09/17	1323	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		236	1.00	1.00	umhos/cm		1	VH1	06/08/17	1057	1671823	8
PH "As Received"												
pH at Temp 10.9C	H	7.26	0.010	0.100	SU		1	RXB5	06/09/17	1321	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133306  
Sample ID: 424596002

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133334  
Sample ID: 424596003  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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	MXL2	06/03/17	0946	1670735	1
Fluoride	J	0.0887	0.033	0.100	mg/L		1					
Sulfate		7.60	0.133	0.400	mg/L		1					
Chloride		20.7	0.335	1.00	mg/L		5	MXL2	06/05/17	1702	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.104	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0952	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.675	0.017	0.050	mg/L		1	AXH3	06/05/17	0857	1670096	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.0476	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1139	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		107	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		46.4	1.45	4.00	mg/L			RXB5	06/09/17	1328	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		228	1.00	1.00	umhos/cm		1	VH1	06/08/17	1058	1671823	8
PH "As Received"												
pH at Temp 11.8C	H	7.26	0.010	0.100	SU		1	RXB5	06/09/17	1327	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381



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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133334  
Sample ID: 424596003

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133336  
Sample ID: 424596004  
Matrix: W  
Collect Date: 31-MAY-17 11:30  
Receive Date: 02-JUN-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		1.79	0.330	1.00	mg/L		1	TSM	06/10/17	0211	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0845	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1444	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007  
Matrix: W  
Collect Date: 31-MAY-17 08:54  
Receive Date: 02-JUN-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	U	ND	0.330	1.00	mg/L		1	TSM	06/10/17	0322	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0846	1670760	2
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/03/17	1015	1670735	3
Chloride	J	0.0894	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.060	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0953	1670372	4
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	06/05/17	0858	1670096	5
PO4 "As Received"												
Phosphorus, Total as P	J	0.0319	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1146	1670383	6
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1458	1670378	7
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids	U	ND	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	8
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3	U	ND	1.45	4.00	mg/L			RXB5	06/09/17	1330	1671987	9
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		1.67	1.00	1.00	umhos/cm		1	VH1	06/08/17	1058	1671823	10
PH "As Received"												
pH at Temp 9.60C	H	5.70	0.010	0.100	SU		1	RXB5	06/09/17	1329	1671988	11

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
--------	-------------	---------	------	------	------------

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
EPA 335.4	EPA 335.4	Total Cyanide		AXH3	06/07/17		0710		1670759			
EPA 350.1 Prep	EPA 350.1	Ammonia Nitrogen Prep		KLP1	06/08/17		1545		1670371			
EPA 351.2 Prep	EPA 351.2	Total Kjeldahl Nitrogen Prep		KLP1	06/06/17		1700		1670377			
EPA 365.4 Prep	EPA 365.4	Phosphorus, Total in liquid PR		KLP1	06/06/17		1700		1670381			

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW-846:9060		
2	EPA 335.4 1993		
3	EPA:300.0		
4	EPA:350.1		
5	EPA:353.2		
6	EPA 365.4 1974		
7	EPA:351.2		
8	EPA:160.1		
9	EPA:310.1		
10	EPA:120.1		
11	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

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133288  
Sample ID: 424596009  
Matrix: W  
Collect Date: 31-MAY-17 12:25  
Receive Date: 02-JUN-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		1.63	0.330	1.00	mg/L		1	TSM	06/10/17	0543	1670679	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0847	1670760	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/07/17	1445	1670378	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0710	1670759
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/06/17	1700	1670377

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: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133316  
Sample ID: 424596010  
Matrix: W  
Collect Date: 31-MAY-17 12:25  
Receive Date: 02-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.198	0.067	0.200	mg/L		1	MXL2	06/03/17	1044	1670735	1
Fluoride		0.116	0.033	0.100	mg/L		1					
Sulfate		8.83	0.133	0.400	mg/L		1					
Chloride		66.5	0.670	2.00	mg/L		10	MXL2	06/05/17	1731	1670735	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0941	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	0954	1670372	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.05	0.017	0.050	mg/L		1	AXH3	06/05/17	0900	1670096	4
PO4 "As Received"												
Phosphorus, Total as P		0.0585	0.020	0.050	mg/L	1.00	1	KLP1	06/07/17	1147	1670383	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		120	3.40	14.3	mg/L			KLP1	06/07/17	1537	1671087	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		61.4	1.45	4.00	mg/L			RXB5	06/09/17	1333	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		190	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 9.30C	H	7.38	0.010	0.100	SU		1	RXB5	06/09/17	1331	1671988	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1670371
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/06/17	1700	1670381

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1633

Client Sample ID: CAWA-17-133316  
Sample ID: 424596010

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:300.0											
3	EPA:350.1											
4	EPA:353.2											
5	EPA 365.4 1974											
6	EPA:160.1											
7	EPA:310.1											
8	EPA:120.1											
9	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**



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## QC Summary

Report Date: June 22, 2017

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

Contact: Mr. Keith Greene

Workorder: 424596

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1670679										
QC1203803830	424596007	DUP									
Total Organic Carbon Average		U	ND	U	ND	mg/L	N/A		TSM	06/10/17	04:09
QC1203803828	LCS										
Total Organic Carbon Average	10.0				10.4	mg/L	104	(80%-120%)		06/09/17	17:24
QC1203803827	MB										
Total Organic Carbon Average			U	ND	mg/L					06/09/17	17:12
QC1203803832	424596007	PS									
Total Organic Carbon Average	10.0	U	ND		10.7	mg/L	106	(75%-125%)		06/10/17	04:56
<b>Flow Injection Analysis</b>											
Batch	1670760										
QC1203803259	424596001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/07/17	08:43
QC1203803258	LCS										
Cyanide, Total	50.0				50.9	ug/L	102	(90%-110%)		06/07/17	08:28
QC1203803257	MB										
Cyanide, Total			U	ND	ug/L					06/07/17	08:27
QC1203803262	424596001	MS									
Cyanide, Total	100	U	ND		107	ug/L	107	(90%-110%)		06/07/17	08:44
<b>Ion Chromatography</b>											
Batch	1670735										
QC1203803177	424596010	DUP									
Bromide		J	0.198	J	0.198	mg/L	0.0505	^	(+/-0.200)	MXL2	06/03/17 11:13

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1670735										
Chloride		66.5		66.6	mg/L	0.113		(0%-20%)	MXL2	06/05/17	18:00
Fluoride		0.116		0.118	mg/L	1.79	^	(+/-0.100)		06/03/17	11:13
Sulfate		8.83		8.81	mg/L	0.315		(0%-20%)			
QC1203803176 LCS											
Bromide	1.25			1.27	mg/L		102	(80%-120%)		06/03/17	08:20
Chloride	5.00			4.77	mg/L		95.4	(80%-120%)			
Fluoride	2.50			2.46	mg/L		98.6	(80%-120%)			
Sulfate	10.0			10.0	mg/L		100	(80%-120%)			
QC1203803175 MB											
Bromide			U	ND	mg/L					06/03/17	07:51
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203803178 424596010 PS											
Bromide	1.25	J	0.198	1.43	mg/L		98.5	(75%-125%)		06/03/17	11:42
Chloride	5.00		6.65	12.1	mg/L		109	(75%-125%)		06/05/17	18:29
Fluoride	2.50		0.116	2.52	mg/L		96.2	(75%-125%)		06/03/17	11:42
Sulfate	10.0		8.83	19.3	mg/L		105	(75%-125%)			

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1670096										
QC1203801611	424151005	DUP									
Nitrogen, Nitrate/Nitrite		U	ND	U	ND	mg/L	N/A		AXH3	06/05/17	08:40
QC1203801610	LCS										
Nitrogen, Nitrate/Nitrite	1.00				0.994	mg/L	99.4	(90%-110%)		06/05/17	08:37
QC1203801609	MB										
Nitrogen, Nitrate/Nitrite			U		ND	mg/L				06/05/17	08:36
QC1203801613	424151005	PS									
Nitrogen, Nitrate/Nitrite	1.00	U	ND		1.00	mg/L	100	(90%-110%)		06/05/17	08:41
Batch	1670372										
QC1203803278	424596002	DUP									
Nitrogen, Ammonia			0.0929		0.074	mg/L	22.6 ^	(+/-0.050)	KLP1	06/09/17	09:50
QC1203802235	LCS										
Nitrogen, Ammonia	1.00				1.00	mg/L	100	(90%-110%)		06/09/17	09:28
QC1203802234	MB										
Nitrogen, Ammonia			J		0.0406	mg/L				06/09/17	09:27
QC1203803279	424596002	MS									
Nitrogen, Ammonia	1.00		0.0929		1.00	mg/L	90.7	(90%-110%)		06/09/17	09:51
Batch	1670378										
QC1203803289	424596001	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	06/07/17	14:42
QC1203802249	LCS										
Nitrogen, Total Kjeldahl	1.00				0.994	mg/L	99.4	(90%-110%)		06/07/17	14:29
QC1203802248	MB										
Nitrogen, Total Kjeldahl			U		ND	mg/L				06/07/17	14:28

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1670378										
QC1203803290	424596001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.807	mg/L		79 *	(90%-110%)	KLP1	06/07/17	14:43
Batch	1670383										
QC1203803294	424596002	DUP									
Phosphorus, Total as P		J	0.039	J	0.0444	mg/L	12.9 ^	(+/-0.050)	KLP1	06/07/17	11:38
QC1203802259	LCS										
Phosphorus, Total as P	1.00				1.03	mg/L		103	(80%-124%)		06/07/17 11:25
QC1203802258	MB										
Phosphorus, Total as P				J	0.0271	mg/L					06/07/17 11:24
QC1203803295	424596002	MS									
Phosphorus, Total as P	1.00	J	0.039		1.01	mg/L		97.1	(63%-139%)		06/07/17 11:38
<b>Solids Analysis</b>											
Batch	1671087										
QC1203804103	424596002	DUP									
Total Dissolved Solids			149		134	mg/L	10.1 *	(0%-5%)	KLP1	06/07/17	15:37
QC1203804104	424596003	DUP									
Total Dissolved Solids			107		127	mg/L	17.1 *	(0%-5%)			06/07/17 15:37
QC1203804102	LCS										
Total Dissolved Solids	300				287	mg/L		95.7	(95%-105%)		06/07/17 15:37
QC1203804101	MB										
Total Dissolved Solids				U	ND	mg/L					06/07/17 15:37
<b>Titration and Ion Analysis</b>											
Batch	1671823										
QC1203805835	424596002	DUP									
Conductivity			236		233	umhos/cm	1.28	(0%-10%)	VH1	06/08/17	10:57

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1671823										
QC1203805836	424747001	DUP									
Conductivity			157		156	umhos/cm	0.639	(0%-10%)	VH1	06/08/17	11:04
QC1203805834	LCS										
Conductivity	1410				1400	umhos/cm	99.2	(95%-105%)		06/08/17	10:45
Batch	1671987										
QC1203806285	424747001	DUP									
Alkalinity, Total as CaCO3			58.6		59.0	mg/L	0.68	(0%-20%)	RXB5	06/09/17	13:58
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203806283	LCS										
Alkalinity, Total as CaCO3	100				108	mg/L	108	(90%-110%)		06/09/17	13:09
QC1203806287	424747001	MS									
Alkalinity, Total as CaCO3	100		58.6		165	mg/L	107	(80%-120%)		06/09/17	13:59
Batch	1671988										
QC1203806296	424596002	DUP									
pH		H	7.26	H	7.27	SU	0.138	(0%-5%)	RXB5	06/09/17	13:23
QC1203806295	LCS										
pH	7.00				7.01	SU	100	(99%-101%)		06/09/17	13:08

### 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

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 424596

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
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.

# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 07-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 351.2, EPA 351.2 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> CCUV, ESHL, INEL, SPOA
<b>Batch ID:</b> 1670378	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424482,424561,424596(2017-1633)</b> <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203802251MS, 1203803290MS		1. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity. Nitrogen, Total Kjeldahl 1203802251 (WRP153013AMS) [85.1* (90%-110%)] and 1203803290 (CAWA-17-133278MS) [79* (90%-110%)].	

**Originator's Name:**  
Kristen Mizzell 07-JUN-17

**Data Validator/Group Leader:**  
Aubrey Kingsbury 09-JUN-17



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 09-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE ANALYTICAL	<b>Test / Method:</b> EPA 160.1, SM 2540C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BELI, ESHL
<b>Batch ID:</b> 1671087	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633),424616</b> <b>Application Issues:</b> Sample received out of holding Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP: QC 1203804103DUP,1203804104DUP 2. Sample received out of holding: 424616 001,004,005,006,007,010		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203804103 (CAWA-17-133306DUP) [10.1* (0%-5%)] and 1203804104 (CAWA-17-133334DUP) [17.1* (0%-5%)]. 2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 424616001 (1. Butterworth - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616004 (4. Blodgett - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616005 (5. Blodgett - RO Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616006 (6. Blodgett - Hot Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616007 (7. South Pavilion - Cold Water) [Received 01-JUN-17, out of holding 31-MAY-17]. 424616010 (10. Madera Community - Washer Water) [Received 01-JUN-17, out of holding 31-MAY-17].	

**Originator's Name:**

Kristen Mizzell 09-JUN-17

**Data Validator/Group Leader:**

Aubrey Kingsbury 09-JUN-17

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 10-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GELC
<b>Batch ID:</b> 1671988	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 424296,424297,424596(2017-1633),424735(2017-1647),424739(2017-1645),424741(2017-1644),424747(2017-1649) <b>Application Issues:</b> Sample received out of holding Sample Logged out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Logged out of Holding: 424296 001  2. Sample received out of holding: 424297 001 424596 002,003,007,010 424735 002,004 424739 001 424741 001,003,006,008,009 424747 001 QC 1203806296DUP,1203806297DUP		1. Sample (See Below) was logged in for this analysis outside of the method specified holding time. The data is qualified. 424296001 (Rad Pyridine 7647) [Logged 30-MAY-17, out of holding 30-MAY-17].  2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203806296 (CAWA-17-133306DUP) [Received 02-JUN-17, out of holding 31-MAY-17]. 1203806297 (CAWA-17-13332DUP) [Received 06-JUN-17, out of holding 02-JUN-17]. 424297001 (Non-Rad Pyridine 7856) [Received 30-MAY-17, out of holding 30-MAY-17]. 424596002 (CAWA-17-133306) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596003 (CAWA-17-133334) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596007 (CAWA-17-134191) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596010 (CAWA-17-133316) [Received 02-JUN-17, out of holding 31-MAY-17]. 424735002 (CAWA-17-134176) [Received 06-JUN-17, out of holding 02-JUN-17]. 424735004 (CAWA-17-133309) [Received 06-JUN-17, out of holding 02-JUN-17]. 424739001 (CAPA-17133354) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741001 (CAPA-17-133353) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741003 (CAPA-17-133360) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741006 (CAWA-17-133318) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741008 (CAPA-17-133358) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741009 (CAPA-17-133359) [Received 06-JUN-17, out of holding 01-JUN-17]. 424747001 (CAWA-17-133332) [Received 06-JUN-17, out of holding 02-JUN-17].	

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

# **Radiological Analysis**

# Case Narrative

**Radiochemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1633  
Work Order #: 424596**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1670707

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203803116	Method Blank (MB)
1203803118	Laboratory Control Sample (LCS)
1203803117	424596007(CAWA-17-134191) 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 June 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 1203803116 (MB) and 1203803118 (LCS) were changed to 1.0 per client request.

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank result is less than 1.65 times the CSU.

**Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

**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 prep or reanalysis.

**Recounts**

None of the samples in this sample set were recounted.

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

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:**

**ISOPU**

Analytical Method:

HASL-300:ISOPU

Analytical Batch Number: 1670709

Sample ID	Client ID
424596007	CAWA-17-134191
1203803122	Method Blank (MB)
1203803124	Laboratory Control Sample (LCS)
1203803123	424596007(CAWA-17-134191) 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 June 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 1203803122 (MB) and 1203803124 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank 1203803122 (MB) result for Pu-239/240 is greater than 1.65 times the CSU but less than the MDC.

##### **Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

##### **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.

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

A data exception report (DER) 1644801 was generated for sample 424596007 (CAWA-17-134191) in this SDG/batch. DER 1644801 was generated due to Other. 1. Sample 424596007 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank 1203803122 (MB) result for Pu-239/240 is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>IsoU</b>
Analytical Method:	HASL-300:ISOU
Analytical Batch Number:	1670711

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203803125	Method Blank (MB)
1203803127	Laboratory Control Sample (LCS)
1203803126	424596007(CAWA-17-134191) 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 June 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 1203803125 (MB) and 1203803127 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank 1203803125 (MB) results for U-233/234 and U-238 are greater than 1.65 times the CSU but less than the MDC.

##### **Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

##### **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**

Samples were recounted due to a suspected blank false positive. The recounts are reported.

### **Miscellaneous Information:**

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

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

#### **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**

The MDCs (and Lc if requested) are calculated using a blank population.

#### **Blank Decision Level**

The blank 1203803125 (MB) result for U-233/234 is greater than the decision level but less than the MDC.

### **Qualifier Information**

Manual qualifiers were not required.

### **Method/Analysis Information**

**Product:**                      **Gammasec**

Analytical Method:              EPA:901.1

Analytical Batch Number:      1673943

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203811244	Method Blank (MB)
1203811246	Laboratory Control Sample (LCS)
1203811245	424596007(CAWA-17-134191) 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 2016, May 2017 and September 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**

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

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank, 1203811244 (MB), result for Co-60 is greater than 1.65 times the CSU but less than the MDC.

**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.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1671753

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203805583	Method Blank (MB)
1203805586	Laboratory Control Sample (LCS)
1203805584	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805585	424596007(CAWA-17-134191) 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-RAD-A-004 REV# 18.

#### **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 1203805583 (MB) and 1203805586 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank result is less than 1.65 times the CSU.

**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.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**

Sample 1203805583 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Sample 1203805584 (CAWA-17-134191DUP) was recounted due to a suspected false positive. The recount is reported.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** WSP-GrossA/B

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1671754

<b>Sample ID</b>	<b>Client ID</b>
424596007	CAWA-17-134191
1203805587	Method Blank (MB)
1203805591	Laboratory Control Sample (LCS)
1203805588	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805589	424596007(CAWA-17-134191) 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-RAD-A-001 REV# 19.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 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 1203805587 (MB) and 1203805591 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **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.

##### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

##### **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**

Sample 1203805591 (LCS) was recounted due to high recovery. The recount is reported.

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

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

**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, 1203805589 (CAWA-17-134191MS) and 1203805590 (CAWA-17-134191MSD), aliquots were reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

**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.



## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1633 GEL Work Order: 424596


**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:** Theresa Austin

**Date:** 26 JUN 2017

**Title:** Group Leader

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 22-JUN-17	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ALPHA SPECTROMETER	<b>Test / Method:</b> DOE EML HASL-300, Pu-11-RC Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1670709	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424596(2017-1633)</b> <b>Application Issues:</b> Other			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Sample 424596007 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.		1. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.	

**Originator's Name:**  
Jennifer Griesbach      22-JUN-17

**Data Validator/Group Leader:**  
Jessica Davis              26-JUN-17

# Sample Data Summary

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Report Date: June 26, 2017

Client Sample ID: CAWA-17-134191  
Sample ID: 424596007  
Matrix: W  
Collect Date: 31-MAY-17  
Receive Date: 02-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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### Rad Alpha Spec Analysis

*Alphaspec Am241 Liquid "As Received"*

Americium-241	U	-0.00775	+/-0.00671	0.0323	0.0135	+/-0.00671	0.050	pCi/L			HAKB	06/21/17	1426	1670707	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0217	+/-0.0106	0.0371	0.0156	+/-0.0107	0.050	pCi/L			HAKB	06/21/17	1426	1670709	2
Plutonium-239/240	U	0.0217	+/-0.0141	0.0394	0.0167	+/-0.0141	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234	U	0.0184	+/-0.0103	0.0785	0.0343	+/-0.0103	1.00	pCi/L			HAKB	06/24/17	1905	1670711	3
Uranium-235/236	U	0.0318	+/-0.0131	0.0769	0.0323	+/-0.0132	1.00	pCi/L							
Uranium-238	U	0.0184	+/-0.0103	0.0812	0.0356	+/-0.0103	0.500	pCi/L							

### Rad Gamma Spec Analysis

*Gammasespec "As Received"*

Cesium-137	U	-0.436	+/-1.25	4.44	1.92	+/-1.26	8.00	pCi/L			MJH1	06/20/17	0706	1673943	4
Cobalt-60	U	0.846	+/-1.18	5.08	2.12	+/-1.19	8.00	pCi/L							
Neptunium-237	U	-1.16	+/-2.41	8.47	3.85	+/-2.43		pCi/L							
Potassium-40	U	-21.5	+/-13.9	51.9	21.8	+/-14.7		pCi/L							
Sodium-22	U	2.87	+/-1.39	6.34	2.76	+/-1.54		pCi/L							

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

Strontium-90	U	0.126	+/-0.0615	0.201	0.096	+/-0.0624	0.500	pCi/L			KSD1	06/10/17	1148	1671753	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	0.035	+/-0.788	2.87	1.29	+/-0.788	3.00	pCi/L			LXB3	06/09/17	1159	1671754	6
Alpha	U	-0.172	+/-0.325	1.43	0.574	+/-0.325	3.00	pCi/L			LXB3	06/12/17	1241	1671754	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"	1670707	96.2	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1670709	87.2	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1670711	99.5	(50%-105%)

# GEL LABORATORIES LLC

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

## Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: June 26, 2017

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-134191

Sample ID: 424596007

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"							1671753	78.7	(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

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: June 26, 2017

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

Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 424596

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1670707										
QC1203803117	424596007	DUP									
Americium-241	U	-0.00775	U	0.0159	pCi/L	0.902		(0-1)	HAKB	06/21/17	14:26
	Uncert:	+/-0.00671		+/-0.00639							
	TPU:	+/-0.00671		+/-0.00642							
**Americium-243 Tracer	2.62	2.52		2.55	pCi/L		97.2	(50%-105%)			
	Uncert:	+/-0.0711		+/-0.0679							
	TPU:	+/-0.134		+/-0.130							
QC1203803118	LCS										
Americium-241	1.97			1.74	pCi/L		88.7	(80%-120%)	HAKB	06/21/17	14:26
	Uncert:			+/-0.0501							
	TPU:			+/-0.0894							
**Americium-243 Tracer	2.10			2.08	pCi/L		99.1	(50%-105%)			
	Uncert:			+/-0.0545							
	TPU:			+/-0.104							
QC1203803116	MB										
Americium-241			U	0.00599	pCi/L				HAKB	06/21/17	14:26
	Uncert:			+/-0.00529							
	TPU:			+/-0.00529							
**Americium-243 Tracer	2.10			1.67	pCi/L		79.8	(50%-105%)			
	Uncert:			+/-0.0645							
	TPU:			+/-0.115							
Batch	1670709										
QC1203803123	424596007	DUP									
Plutonium-238	U	0.0217	U	8.13E-10	pCi/L	0.652		(0-1)	HAKB	06/21/17	14:26
	Uncert:	+/-0.0106		+/-0.00598							
	TPU:	+/-0.0107		+/-0.00598							
Plutonium-239/240	U	0.0217	U	-0.00732	pCi/L	0.634		(0-1)			
	Uncert:	+/-0.0141		+/-0.00879							
	TPU:	+/-0.0141		+/-0.00879							
**Plutonium-242 Tracer	2.46	2.15		1.67	pCi/L		68	(50%-105%)			
	Uncert:	+/-0.0752		+/-0.078							
	TPU:	+/-0.127		+/-0.130							
QC1203803124	LCS										
Plutonium-238			U	0.0151	pCi/L			(80%-120%)	HAKB	06/21/17	14:26
	Uncert:			+/-0.008							
	TPU:			+/-0.00802							
Plutonium-239/240	1.98			2.00	pCi/L		101	(80%-120%)			
	Uncert:			+/-0.0617							
	TPU:			+/-0.104							
**Plutonium-242 Tracer	1.97			1.57	pCi/L		79.9	(50%-105%)			
	Uncert:			+/-0.0613							
	TPU:			+/-0.103							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1670709										
QC1203803122	MB										
Plutonium-238			U	-0.0047	pCi/L				HAKB	06/21/17	14:26
				Uncert:							
				TPU:							
Plutonium-239/240			U	0.0204	pCi/L						
				Uncert:							
				TPU:							
**Plutonium-242 Tracer	1.97			1.72	pCi/L		87.3	(50%-105%)			
				Uncert:							
				TPU:							
Batch	1670711										
QC1203803126	424596007	DUP									
Uranium-234		U	0.0184	U	0.0238	pCi/L	0.0962	(0-1)	HAKB	06/24/17	19:05
				Uncert:							
				TPU:							
Uranium-235/236		U	0.0318	U	0.00319	pCi/L	0.543	(0-1)			
				Uncert:							
				TPU:							
Uranium-238		U	0.0184	U	0.00779	pCi/L	0.208	(0-1)			
				Uncert:							
				TPU:							
**Uranium-232 Tracer	2.61	2.60		1.84	pCi/L		70.7	(50%-105%)			
				Uncert:							
				TPU:							
QC1203803127	LCS										
Uranium-234				2.79	pCi/L				HAKB	06/24/17	19:05
				Uncert:							
				TPU:							
Uranium-235/236				0.162	pCi/L						
				Uncert:							
				TPU:							
Uranium-238	2.70			2.98	pCi/L		110	(80%-120%)			
				Uncert:							
				TPU:							
**Uranium-232 Tracer	2.09			1.74	pCi/L		83.6	(50%-105%)			
				Uncert:							
				TPU:							
QC1203803125	MB										
Uranium-234			U	0.0691	pCi/L				HAKB	06/24/17	19:05
				Uncert:							
				TPU:							
Uranium-235/236			U	0.0118	pCi/L						
				Uncert:							
				TPU:							
Uranium-238			U	0.0191	pCi/L						
				Uncert:							
				TPU:							



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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1670711										
**Uranium-232 Tracer		2.09		1.68	pCi/L		80.7	(50%-105%)			
		Uncert:		+/-0.090							
		TPU:		+/-0.149							
Rad Gamma Spec											
Batch	1673943										
QC1203811245	424596007	DUP									
Cesium-137	U	-0.436	U	-1.4	pCi/L	0.175		(0-1)	MJH1	06/20/17	09:12
	Uncert:	+/-1.25		+/-1.46							
	TPU:	+/-1.26		+/-1.50							
Cobalt-60	U	0.846	U	1.40	pCi/L	0.103		(0-1)			
	Uncert:	+/-1.18		+/-1.47							
	TPU:	+/-1.19		+/-1.50							
Neptunium-237	U	-1.16	U	-0.827	pCi/L	0.0352		(0-1)			
	Uncert:	+/-2.41		+/-2.33							
	TPU:	+/-2.43		+/-2.34							
Potassium-40	U	-21.5	U	-37.4	pCi/L	0.226		(0-1)			
	Uncert:	+/-13.9		+/-18.6							
	TPU:	+/-14.7		+/-20.6							
Sodium-22	U	2.87	U	-0.526	pCi/L	0.604		(0-1)			
	Uncert:	+/-1.39		+/-1.27							
	TPU:	+/-1.54		+/-1.27							
QC1203811246	LCS										
Americium-241	34300			36900	pCi/L		108	(80%-120%)	MJH1	06/20/17	08:51
	Uncert:			+/-461							
	TPU:			+/-1470							
Cesium-137	13100			14200	pCi/L		108	(80%-120%)			
	Uncert:			+/-165							
	TPU:			+/-353							
Cobalt-60	11900			11900	pCi/L		100	(80%-120%)			
	Uncert:			+/-166							
	TPU:			+/-279							
Neptunium-237			U	22.0	pCi/L						
	Uncert:			+/-51.8							
	TPU:			+/-52.0							
Potassium-40			U	-6.16	pCi/L						
	Uncert:			+/-120							
	TPU:			+/-120							
Sodium-22			U	3.12	pCi/L						
	Uncert:			+/-15.0							
	TPU:			+/-15.0							
QC1203811244	MB										
Cesium-137			U	-0.404	pCi/L				MJH1	06/20/17	07:16
	Uncert:			+/-1.20							
	TPU:			+/-1.20							
Cobalt-60			U	2.21	pCi/L						
	Uncert:			+/-1.09							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	1673943										
Neptunium-237	TPU:			+/-1.21							
			U	1.32	pCi/L						
	Uncert:			+/-2.04							
Potassium-40	TPU:			+/-2.06							
			U	-39.9	pCi/L						
	Uncert:			+/-15.8							
Sodium-22	TPU:			+/-18.5							
			U	-1.07	pCi/L						
	Uncert:			+/-1.04							
	TPU:			+/-1.07							
<b>Rad Gas Flow</b>											
Batch	1671753										
QC1203805584	424596007	DUP									
Strontium-90	U	0.126	U	0.361	pCi/L	0.564		(0-1)	KSD1	06/12/17	12:27
	Uncert:	+/-0.0615		+/-0.143							
	TPU:	+/-0.0624		+/-0.146							
**Strontium Carrier	7.75	6.10		6.50	mg		83.9	(50%-105%)			
QC1203805586	LCS										
Strontium-90	21.9			24.5	pCi/L		112	(80%-120%)	KSD1	06/12/17	09:09
	Uncert:			+/-0.615							
	TPU:			+/-2.10							
**Strontium Carrier	7.75			5.30	mg		68.4	(50%-105%)			
QC1203805583	MB										
Strontium-90			U	0.101	pCi/L				KSD1	06/12/17	14:18
	Uncert:			+/-0.0861							
	TPU:			+/-0.0864							
**Strontium Carrier	7.75			7.10	mg		91.6	(50%-105%)			
QC1203805585	424596007	MS									
Strontium-90	438	U	0.126	428	pCi/L		97.8	(75%-125%)	KSD1	06/12/17	09:09
	Uncert:		+/-0.0615	+/-9.65							
	TPU:		+/-0.0624	+/-35.8							
**Strontium Carrier	7.75	6.10		7.50	mg		96.8	(50%-105%)			
Batch	1671754										
QC1203805588	424596007	DUP									
Alpha	U	-0.172	U	0.311	pCi/L	0.385		(0-1)	LXB3	06/12/17	12:41
	Uncert:	+/-0.325		+/-0.300							
	TPU:	+/-0.325		+/-0.302							
Beta	U	0.035	U	0.295	pCi/L	0.0822		(0-1)		06/09/17	11:59
	Uncert:	+/-0.788		+/-0.795							
	TPU:	+/-0.788		+/-0.795							
QC1203805591	LCS										
Alpha	12.1			11.1	pCi/L		91.8	(80%-120%)	LXB3	06/13/17	07:42
	Uncert:			+/-0.582							
	TPU:			+/-1.17							
Beta	43.8			47.8	pCi/L		109	(80%-120%)		06/09/17	11:59

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1671754										
		Uncert:		+/-0.853							
		TPU:		+/-4.05							
QC1203805587	MB										
Alpha			U	0.102	pCi/L				LXB3	06/12/17	12:41
		Uncert:		+/-0.081							
		TPU:		+/-0.0815							
Beta			U	-0.00971	pCi/L					06/09/17	11:59
		Uncert:		+/-0.121							
		TPU:		+/-0.121							
QC1203805589	424596007	MS									
Alpha	242	U	-0.172	251	pCi/L		104	(75%-125%)	LXB3	06/12/17	12:42
		Uncert:	+/-0.325	+/-11.8							
		TPU:	+/-0.325	+/-24.2							
Beta	875	U	0.035	1050	pCi/L		120	(75%-125%)		06/09/17	11:59
		Uncert:	+/-0.788	+/-18.3							
		TPU:	+/-0.788	+/-89.7							
QC1203805590	424596007	MSD									
Alpha	242	U	-0.172	237	pCi/L	0.153	97.9	(0-1)	LXB3	06/12/17	12:42
		Uncert:	+/-0.325	+/-11.7							
		TPU:	+/-0.325	+/-23.2							
Beta	875	U	0.035	973	pCi/L	0.22	111	(0-1)		06/09/17	11:59
		Uncert:	+/-0.788	+/-17.2							
		TPU:	+/-0.788	+/-83.0							

### 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.