

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:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142867

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1147 1047 KT 8/30/17		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

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

KT 8/30/17

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 8/30/17 1358	RECEIVED BY (Printed Name) (Signature)	M. Montoya <i>[Signature]</i>	Date/Time 8/30/17 1358
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142902

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1147 1047 <i>8/30/17</i>		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500 ML POLY	1	HNO3	Y	NA
↓	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	↓	↓
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

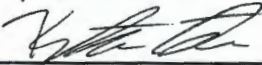
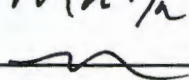
Sample Time	1147	HH:MM	Dissolved Oxygen	5.66	Flow (in gpm)	2.88
Oxidation-Reduction Potential	248.0		pH	6.91	Specific Conductance	185.5
Temperature	14.2		Turbidity	0.77		

COLLECTED BY (PRINT): A. Vigil & K. Tow

Date/Time

Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11390**EVENT NAME:** Water/CdV (TA16 260) Q4 MY2017**SAMPLE ID:** CAWA-17-142902**WORK ORDER:**

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow 	8/30/17 1358	RECEIVED BY (Printed Name) (Signature)	M. Montez 	8/30/17 1358
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-143024

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8/30/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1147 1047		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	CDV-9-1(i) S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

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

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

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

KT 8/30/17

COLLECTED BY (PRINT): A. Vigil & K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 8/30/17 1358	RECEIVED BY (Printed Name) (Signature)	M. Martin <i>[Signature]</i>	Date/Time 8/30/17 1358
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 08/24/2017

COC: 2017-2640

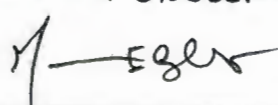
TEST - Field Screen		YES	NO	NA
The sample has field screening measurements of alpha activity and beta activity.				
Activity (dpm/100cm ²)	Sampled Location			
Alpha > 16 and < 20,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			
Alpha > 125 and 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

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

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

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) MATI ENGLERT	8-31-17
(Signature) 	9:59

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2640

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
432041	EPA:120.1	1				
432041	EPA:150.1	1				
432041	EPA:160.1	1				
432041	EPA:170.0	2		1		
432041	EPA:245.2	2				
432041	EPA:300.0	1				
432041	EPA:310.1	1				
432041	EPA:335.4	1				
432041	EPA:350.1	1				
432041	EPA:351.2	1				
432041	EPA:353.2	1				
432041	EPA:365.4	1				
432041	SM:A2340B	1				
432041	SW-846:6010C	1				
432041	SW-846:6020	1				
432041	SW-846:6850	1				
432041	SW-846:8260B	1		1		
432041	SW-846:8270D	1				
432041	SW-846:8330B	1				
432041	SW-846:9060	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	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
432041	EPA:120.1	1701648	1701648	1										1				2			
432041	EPA:150.1	1698844	1698844	1										1				1			
432041	EPA:160.1	1698443	1698443	1					1					1				1			
432041	EPA:170.0	NA	NA	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
432041	EPA:245.2	1700519	1700517	2					1	1				1				1			
432041	EPA:300.0	1699852	1699852	1					1					1				1			
432041	EPA:310.1	1698841	1698841	1						1				1				1			
432041	EPA:335.4	1697937	1697936	1					1	1				1				1			
432041	EPA:350.1	1698259	1698258	1					1	1				1				1			
432041	EPA:351.2	1698312	1698311	1					1	1				1				1			
432041	EPA:353.2	1698270	1698270	1					1					1				1			
432041	EPA:365.4	1698269	1698268	1					1	1				1				1			
432041	SM:A2340B	1704101	1704101	1																	
432041	SW-846:6010C	1697911	1697910	1					1	1				1				1			
432041	SW-846:6020	1697899	1697898	1					1	1				1				1			
432041	SW-846:6850	1698696	1698687	1					1	1	1			1							
432041	SW-846:8260B	1698788	1698788	1		1			2					4							
432041	SW-846:8270D	1698645	1698644	1					1	1	1			1							
432041	SW-846:8330B	1698678	1698677	1					1	1	1			1							
432041	SW-846:9060	1699093	1699093	1					1					1				2			

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:120.1	GENERAL CHEMISTRY	CAPA-17-142931	1203877745	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142859	1203877746	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203877744	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142881	1203871261	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203870477	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142867	1203869517	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203869514	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203869513	MB	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:170.0	VOC	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142902	432041002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-143024	432041004	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142867	1203874701	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142867	1203874702	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142902	432041003	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203874700	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203874699	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CrIN1-17-145287	1203872823	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203872822	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203872821	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142881	1203870473	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142881	1203870475	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203870470	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142902	1203868315	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142902	1203868317	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142902	432041003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203868314	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203868313	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203868980	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203868979	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST35-17-144903	1203868982	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST35-17-144903	1203868984	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142902	432041003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203869130	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203869129	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST35-17-144895	1203869131	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST35-17-144895	1203869132	MS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203869020	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203869019	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	WST35-17-144903	1203869021	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142867	432041001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203869010	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203869009	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST35-17-144903	1203869011	DUP	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:365.4	GENERAL CHEMISTRY	WST35-17-144903	1203869015	MS	0	0	1	0
SM:A2340B	INORGANIC	CAWA-17-142867	432041001	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142867	1203868281	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142867	1203868282	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-142867	432041001	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203868280	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203868279	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142867	1203868256	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142867	1203868257	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-142867	432041001	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203868255	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203868254	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870073	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870074	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142867	432041001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203870072	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203870071	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-17-142902	432041002	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143024	432041004	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203870313	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203870314	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203872001	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203872002	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203870312	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203872000	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-17-142902	1203869940	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-142902	1203869941	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-142902	432041002	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203869939	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203869938	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142902	1203870024	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142902	1203870025	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142902	432041003	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203870023	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203870022	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17-142934	1203871105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142902	432041003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203871103	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203871102	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	WT_IPC-17-135360	1203871104	DUP	1	0	0	0

DATA VALIDATION REPORT

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203868279	METHOD BLANK	SW-846:6010C	W	Zinc	3.41	J	ug/L	10.0
MB	1203869009	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.036	J	mg/L	0.050
MB	1203871102	METHOD BLANK	SW-846:9060	W	Total Organic Carbon	0.673	J	mg/L	1.00
CAWA-17-143024	432041004	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-17-142867	1203869009	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.036	mg/L	0.0404	J	0.050	Y	5	100	Y
CAWA-17-142902	1203871102	METHOD BLANK	SW-846:9060	Total Organic Carbon	0.673	mg/L	1.01		1.00	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

DATA VALIDATION REPORT

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
WST35-17-144895	1203869132		EPA:351.2	Total Kjeldahl Nitrogen	1698311	09-07-2017	W	72		110	90	10		
CAWA-17-142902	1203869940	1203869941	SW-846:8270D	Hexachlorocyclopentadiene	1698644	09-06-2017	W	25	23	79	26		6	30
CAWA-17-142902	1203870024	1203870025	SW-846:8330B	2,6-Diamino-4-nitrotoluene	1698677	09-08-2017	W	72	118	127	53		48	30
CAWA-17-142902	1203870024	1203870025	SW-846:8330B	RDX	1698677	09-08-2017	W	59	47	125	57		3	30

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203869939		SW-846:8270D	Pentachlorophenol	1698644	09-06-2017	W	117		116	41				

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-17-142867	432041001	1203869517	EPA:160.1	Total Dissolved	W	129	123	mg/L	Y	Y	6.74	5

11. Any required reporting limits exceeded?

DATA VALIDATION REPORT

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
CDV-9-1(i) S1	2017-2640	CAWA-17-142867	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0404	mg/L	0.0404	mg/L			W	08/30/2017		1698269	VAL	Y
CDV-9-1(i) S1	2017-2640	CAWA-17-142902	REG	INIT	LCMS/MS HIGH EXPLOSIVES	SW-846:8330B	2,6-Diamino-4-nitrotoluene	U	UJ	HE12g	N	0.526	ug/L	0.526	ug/L			W	08/30/2017		1698678	VAL	Y
CDV-9-1(i) S1	2017-2640	CAWA-17-142902	REG	DL	LCMS/MS HIGH EXPLOSIVES	SW-846:8330B	RDX		J	HE12e	Y	20	ug/L	20	ug/L			W	08/30/2017		1698678	VAL	Y
CDV-9-1(i) S1	2017-2640	CAWA-17-142902	REG	INIT	GENERAL CHEMISTRY	SW-846:9060	Total Organic Carbon		U	I4	N	1.01	mg/L	1.01	mg/L			W	08/30/2017		1699093	VAL	Y

Reason Code

Description

HE12e

The MS/MSD percent recovery was >10% but <70%.

HE12g

The MS/MSD relative percent difference was >30%.

I4

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

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:120.1	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:150.1	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:160.1	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:170.0	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:245.2	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:300.0	0	4
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:310.1	0	2

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:350.1	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:353.2	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	EPA:365.4	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	SM:A2340B	0	1
CAWA-17-142867	CDV-9-1(i) S1	REG	SW-846:6010C	0	17
CAWA-17-142867	CDV-9-1(i) S1	REG	SW-846:6020	0	11
CAWA-17-142867	CDV-9-1(i) S1	REG	SW-846:6850	0	1
CAWA-17-142902	CDV-9-1(i) S1	REG	EPA:170.0	0	1
CAWA-17-142902	CDV-9-1(i) S1	REG	EPA:245.2	0	1
CAWA-17-142902	CDV-9-1(i) S1	REG	EPA:335.4	0	1
CAWA-17-142902	CDV-9-1(i) S1	REG	EPA:351.2	0	1
CAWA-17-142902	CDV-9-1(i) S1	REG	SW-846:8260B	0	80
CAWA-17-142902	CDV-9-1(i) S1	REG	SW-846:8270D	0	80
CAWA-17-142902	CDV-9-1(i) S1	REG	SW-846:8330B	0	23
CAWA-17-142902	CDV-9-1(i) S1	REG	SW-846:9060	0	1
CAWA-17-143024	CDV-9-1(i) S1	FTB	EPA:170.0	0	1
CAWA-17-143024	CDV-9-1(i) S1	FTB	SW-846:8260B	0	80

September 18, 2017

gel.com

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

Re: LANL- WQH Water Samples
Work Order: 432041
SDG: 2017-2640

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on September 01, 2017, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,



Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2017-2640
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 432041
SDG: 2017-2640

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 432041
SDG # : 2017-2640**

September 18, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on September 01, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
432041001	CAWA-17-142867
432041002	CAWA-17-142902
432041003	CAWA-17-142902
432041004	CAWA-17-143024


Case Narrative

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

Data Package

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

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


Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 18 September 2017

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

Chain of Custody and Supporting Documentation

Chain of Custody/Analysis Request 432641

[illegible]



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESH		SDG/AR/COC/Work Order: 43204	
Received By: ZKW		Date Received: 9/1/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1782 6674-5C 5908 1782 6652-4C 5908 1782 6663-3C 5908 1782 6641-3C	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 <input checked="" type="checkbox"/> CPM mR/ILr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

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

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials **WCH**Date **9/1/17**Page **1** of **1**

GL-CHL-SR-001 Rev 5

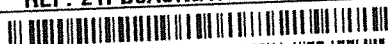
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KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

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ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 668-8171
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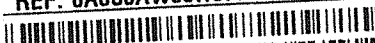
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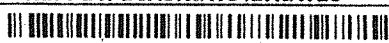
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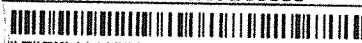
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Subject: LANL receipt issues for 09/01/2017
From: Margo Herron <Margo.Herron@gel.com>
Date: 9/1/2017 3:57 PM
To: "Patel, Nita" <npatel@lanl.gov>
CC: "team.davis" <team.davis@gel.com>

Good Afternoon,

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

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

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

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

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

Have a great weekend.

Thanks,

--

Margo Herron
Project Manager Assistant



2040 Savage Road, Charleston, SC 29407 | PO Box 30712, Charleston, SC 29417
Office Main: 843.556.8171 Ext. 4707 | Fax: 843.766.1178
E-Mail: Margo.Herron@gel.com | Website: www.gel.com
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 #: 2017-2640
Work Order #: 432041**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1698788

Sample Analysis

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

Sample ID	Client ID
432041002	CAWA-17-142902
432041004	CAWA-17-143024
1203870312	Method Blank (MB)
1203870313	Laboratory Control Sample (LCS)
1203870314	Laboratory Control Sample (LCS)
1203870315	431879002(CAWA-17-142897) Post Spike (PS)
1203870316	431879002(CAWA-17-142897) Post Spike (PS)
1203870317	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)
1203870318	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)
1203872000	Method Blank (MB)
1203872001	Laboratory Control Sample (LCS)
1203872002	Laboratory Control Sample (LCS)

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

The data results reported met all SOP and method criteria, unless otherwise discussed below.

SOP Reference

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

Calibration Information

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

industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

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

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples 432041002 (CAWA-17-142902) and

432041004 (CAWA-17-143024) in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2640 GEL Work Order: 432041

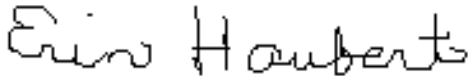
The Qualifiers in this report are defined as follows:

- * 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: 26 SEP 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 432041002	Date Received: 09/01/2017 09:20	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142902	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/09/2017 04:09	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/09/2017 04:09		
Data File: 090817V1\1Y542.D	Column: DB-624	

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/30/2017 11:47	Matrix:	W
Lab Sample ID:	432041002	Date Received:	09/01/2017 09:20		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-142902	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/09/2017 04:09	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/09/2017 04:09				
Data File:	090817V1\1Y542.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	J	0.900	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	J	0.400	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/30/2017 11:47	Matrix:	W
Lab Sample ID:	432041002	Date Received:	09/01/2017 09:20		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-142902	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/09/2017 04:09	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/09/2017 04:09				
Data File:	090817V1\1Y542.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	57.0	50.0	ug/L 114	(71%-134%)
Bromofluorobenzene	51.4	50.0	ug/L 103	(70%-131%)
Toluene-d8	52.6	50.0	ug/L 105	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000541-05-9	unknown siloxane	14.549	10.2	ug/L	91	NJ

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 432041004

Date Collected: 08/30/2017 11:47

Date Received: 09/01/2017 09:20

Matrix: W

Client ID: CAWA-17-143024

Batch ID: 1698788

Run Date: 09/09/2017 04:38

Prep Date: 09/09/2017 04:38

Data File: 090817V1\1Y543.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 432041004

Date Collected: 08/30/2017 11:47

Date Received: 09/01/2017 09:20

Matrix: W

Client ID: CAWA-17-143024

Batch ID: 1698788

Run Date: 09/09/2017 04:38

Prep Date: 09/09/2017 04:38

Data File: 090817V1\1Y543.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 432041004

Date Collected: 08/30/2017 11:47

Date Received: 09/01/2017 09:20

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-143024

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/09/2017 04:38

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/09/2017 04:38

Column: DB-624

Data File: 090817V1\1Y543.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	49.7	50.0	ug/L 99	(70%-131%)
Toluene-d8	51.3	50.0	ug/L 103	(74%-124%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2640**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203870313	LCS for batch 1698788	118	110	93
1203870314	LCS for batch 1698788	118	108	91
1203870312	MB for batch 1698788	119	109	98
1203870315	CAWA-17-142897PS	118	107	91
1203870317	CAWA-17-142897PSD	120	108	93
1203870316	CAWA-17-142897PS	119	107	90
1203870318	CAWA-17-142897PSD	117	105	91
1203872001	LCS for batch 1698788	111	107	93
1203872002	LCS for batch 1698788	111	105	94
1203872000	MB for batch 1698788	112	107	99
432041002	CAWA-17-142902	114	105	103
432041004	CAWA-17-143024	107	103	99

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4 (71%-134%)

TOL = Toluene-d8 (74%-124%)

BFB = Bromofluorobenzene (70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	104	104	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1110	89	61-125
67-64-1	LCS Acetone	250	0.0	261	105	48-157
74-88-4	LCS Iodomethane	250	0.0	232	93	72-128
75-15-0	LCS Carbon disulfide	250	0.0	237	95	69-138
108-05-4	LCS Vinyl acetate	250	0.0	246	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	251	100	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	235	94	66-124
591-78-6	LCS 2-Hexanone	250	0.0	263	105	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	60.1	120	40-160
74-87-3	LCS Chloromethane	50.0	0.0	54.1	108	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	56.2	112	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.1	98	63-137
75-00-3	LCS Chloroethane	50.0	0.0	52.8	106	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	55.0	110	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.9	104	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.7	107	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	50.4	101	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	53.9	108	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	52.7	105	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	51.8	104	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	51.2	102	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile

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**Quality Control Summary
Spike Recovery Report**

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870314

Instrument: VOA1.I

Analysis Date: 09/06/2017 10:51

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	246	98	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	247	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	99	59-125
107-13-1	LCS Acrylonitrile	250	0.0	237	95	65-122
107-12-0	LCS Propionitrile	250	0.0	229	92	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	238	95	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	240	96	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	241	96	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2390	96	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	47.9	96	66-147

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	94.3	94	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1120	89	56-131
67-64-1	PS Acetone	250	0.00 U	120	48	25-155
74-88-4	PS Iodomethane	250	0.00 U	227	91	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	216	86	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	232	93	48-133
78-93-3	PS 2-Butanone	250	0.00 U	152	61	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	222	89	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	181	72	33-138
127-18-4	PS Tetrachloroethylene	50.0	0.490 J	46.3	92	60-130
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	51.9	104	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	48.8	98	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.3	97	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	54.2	108	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	47.6	95	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.7	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	49.8	100	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	45.8	92	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.1	96	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	50.6	101	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	47.2	94	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	46.9	94	67-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2640

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2640

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00 U	95.4	95	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1100	88	56-131	2	0-20
67-64-1	PSD Acetone	250	0.00 U	120	48	25-155	0	0-20
74-88-4	PSD Iodomethane	250	0.00 U	228	91	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	217	87	61-141	0	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	232	93	48-133	0	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	152	61	25-143	0	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	224	90	61-127	1	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	183	73	33-138	1	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.490 J	47.3	94	60-130	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	51.8	104	33-164	0	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	48.7	97	53-139	0	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	49.9	100	58-140	3	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	54.2	108	59-146	0	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	47.7	95	65-129	0	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	48.3	97	65-141	1	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.9	102	69-127	2	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	46.7	93	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	49.4	99	62-123	3	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	51.6	103	69-132	2	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	47.9	96	65-127	2	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	48.2	96	67-127	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2640

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2640

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2640

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870316

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:32

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2640

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870318

Instrument: VOA1.I

Analysis Date: 09/06/2017 20:01

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	83.9	84	71-127
75-05-8	LCS Acetonitrile	1250	0.0	977	78	61-125
67-64-1	LCS Acetone	250	0.0	162	65	48-157
74-88-4	LCS Iodomethane	250	0.0	196	79	72-128
75-15-0	LCS Carbon disulfide	250	0.0	180	72	69-138
108-05-4	LCS Vinyl acetate	250	0.0	219	88	67-125
78-93-3	LCS 2-Butanone	250	0.0	173	69	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	200	80	66-124
591-78-6	LCS 2-Hexanone	250	0.0	179	72	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	38.3	77	40-160
74-87-3	LCS Chloromethane	50.0	0.0	42.3	85	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	42.1	84	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.0	92	63-137
75-00-3	LCS Chloroethane	50.0	0.0	43.5	87	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	41.5	83	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	48.0	96	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	38.6	77	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	42.5	85	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	45.6	91	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	40.9	82	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	41.6	83	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	43.6	87	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872001

Instrument: VOA1.I

Analysis Date: 09/09/2017 00:45

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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

Volatile

Page 1 of 1

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203872002

Instrument: VOA1.I

Analysis Date: 09/09/2017 01:44

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	198	79	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	202	81	61-148
107-05-1	LCS Allyl chloride	250	0.0	219	88	59-125
107-13-1	LCS Acrylonitrile	250	0.0	218	87	65-122
107-12-0	LCS Propionitrile	250	0.0	214	86	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	222	89	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	225	90	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	228	91	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2150	86	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	40.6	81	66-147

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2640	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698788	Instrument ID:	VOA1.I	Data File:	090617V1\1Y307A.D
Lab Sample ID:	1203870312	Prep Date:	09/06/2017 11:20	Analyzed:	09/06/17 11:20
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1698788	1203870313	090617V1\1Y303A.D	09/06/17	0924
02 LCS for batch 1698788	1203870314	090617V1\1Y306A.D	09/06/17	1051
03 CAWA-17-142897PS	1203870315	090617V1\1Y322.D	09/06/17	1834
04 CAWA-17-142897PSD	1203870317	090617V1\1Y323.D	09/06/17	1903
05 CAWA-17-142897PS	1203870316	090617V1\1Y324.D	09/06/17	1932
06 CAWA-17-142897PSD	1203870318	090617V1\1Y325.D	09/06/17	2001

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2640	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698788	Instrument ID:	VOA1.I	Data File:	090817V1\1Y538A.D
Lab Sample ID:	1203872000	Prep Date:	09/09/2017 02:13	Analyzed:	09/09/17 02:13
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
08 LCS for batch 1698788	1203872001	090817V1\1Y535A.D	09/09/17	0045
09 LCS for batch 1698788	1203872002	090817V1\1Y537A.D	09/09/17	0144
10 CAWA-17-142902	432041002	090817V1\1Y542.D	09/09/17	0409
11 CAWA-17-143024	432041004	090817V1\1Y543.D	09/09/17	0438

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640

Lab Sample ID: 1203870312

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 11:20

Prep Date: 09/06/2017 11:20

Data File: 090617V1\1Y307A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 1203870312

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 11:20

Prep Date: 09/06/2017 11:20

Data File: 090617V1\1Y307A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2017-2640	Matrix:	WATER
Lab Sample ID:	1203870312		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	MB for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 11:20	Analyst:	PXY1
Prep Date:	09/06/2017 11:20	Purge Vol:	5 mL
Data File:	090617V1\1Y307A.D	Column:	DB-624

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

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

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2017-2640

Lab Sample ID: 1203870313

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 09:24

Prep Date: 09/06/2017 09:24

Data File: 090617V1\1Y303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 1203870313

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 09:24

Prep Date: 09/06/2017 09:24

Data File: 090617V1\1Y303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2640	Matrix:	WATER
Lab Sample ID:	1203870313		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 09:24	Analyst:	PXY1
Prep Date:	09/06/2017 09:24	Purge Vol:	5 mL
Data File:	090617V1\1Y303A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.9	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		61.0	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		57.6	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		59.2	50.0	ug/L	118	(71%-134%)
Bromofluorobenzene		46.6	50.0	ug/L	93	(70%-131%)
Toluene-d8		54.8	50.0	ug/L	110	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640

Lab Sample ID: 1203870314

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 10:51

Prep Date: 09/06/2017 10:51

Data File: 090617V1\1Y306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640

Matrix: WATER

Lab Sample ID: 1203870314

Client Sample: QC for batch 1698788

Client: ARSL004

Project: QC

Client ID: LCS for batch 1698788

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 10:51

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 10:51

Data File: 090617V1\1Y306A.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number: 2017-2640		Matrix: WATER
Lab Sample ID: 1203870314		
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: LCS for batch 1698788	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 10:51	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 10:51		
Data File: 090617V1\1Y306A.D	Column: DB-624	

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

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

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

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870316	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:32	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:32		
Data File: 090617V1\1Y324.D	Column: DB-624	

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870316	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:32	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:32				
Data File:	090617V1\1Y324.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870316	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:32	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:32				
Data File:	090617V1\1Y324.D	Column:	DB-624		

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

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870317	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:03	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:03		
Data File: 090617V1\1Y323.D	Column: DB-624	

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870317	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:03	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:03				
Data File:	090617V1\1Y323.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870317	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:03	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:03		
Data File: 090617V1\1Y323.D	Column: DB-624	

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

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.D	Column: DB-624	

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.D	Column: DB-624	

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2640	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.D	Column: DB-624	

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

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640

Lab Sample ID: 1203872000

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/09/2017 02:13

Prep Date: 09/09/2017 02:13

Data File: 090817V1\1Y538A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640

Lab Sample ID: 1203872000

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/09/2017 02:13

Prep Date: 09/09/2017 02:13

Data File: 090817V1\1Y538A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number: 2017-2640	Matrix: WATER	
Lab Sample ID: 1203872000		
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: MB for batch 1698788	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/09/2017 02:13	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/09/2017 02:13		
Data File: 090817V1\1Y538A.D	Column: DB-624	

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

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

Tentatively Identified Compound Summary

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2640	Matrix:	WATER
Lab Sample ID:	1203872001		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/09/2017 00:45	Analyst:	PXY1
Prep Date:	09/09/2017 00:45	Purge Vol:	5 mL
Data File:	090817V1\1Y535A.D	Column:	DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640

Lab Sample ID: 1203872001

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/09/2017 00:45

Prep Date: 09/09/2017 00:45

Data File: 090817V1\1Y535A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2640	Matrix:	WATER
Lab Sample ID:	1203872001		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/09/2017 00:45	Analyst:	PXY1
Prep Date:	09/09/2017 00:45		
Data File:	090817V1\1Y535A.D	Column:	DB-624

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

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

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2017-2640	Matrix: WATER
Lab Sample ID: 1203872002	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: LCS for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Project: QC
Run Date: 09/09/2017 01:44	SOP Ref: GL-OA-E-038
Prep Date: 09/09/2017 01:44	Dilution: 1
Data File: 090817V1\1Y537A.D	Purge Vol: 5 mL
	Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2640		Matrix:	WATER
Lab Sample ID: 1203872002			
Client Sample: QC for batch 1698788	Client: ARSL004	Project:	QC
Client ID: LCS for batch 1698788	Method: SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution:	1
Run Date: 09/09/2017 01:44	Analyst: PXY1	Purge Vol:	5 mL
Prep Date: 09/09/2017 01:44			
Data File: 090817V1\1Y537A.D	Column: DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2640	Matrix:	WATER
Lab Sample ID:	1203872002		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/09/2017 01:44	Analyst:	PXY1
Prep Date:	09/09/2017 01:44	Purge Vol:	5 mL
Data File:	090817V1\1Y537A.D	Column:	DB-624

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

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

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2640
Work Order #: 432041**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1698645
Prep Batch Number:	1698644

Sample Analysis

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

Sample ID	Client ID
432041002	CAWA-17-142902
1203869938	Method Blank (MB)
1203869939	Laboratory Control Sample (LCS)
1203869940	432041002(CAWA-17-142902) Matrix Spike (MS)
1203869941	432041002(CAWA-17-142902) 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 and/or LCSD (See Below) did not meet spike recovery acceptance criteria. Since the target analytes were not detected in the associated samples above the reporting limits, the positive bias had no adverse impact on the data.

Sample	Analyte	Value
1203869939 (LCS)	Pentachlorophenol	117* (41%-116%)

QC Sample Designation

Sample 432041002 (CAWA-17-142902) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data were reported.

Sample	Analyte	Value
1203869940 (CAWA-17-142902MS)	Hexachlorocyclopentadiene	25* (26%-79%)
1203869941 (CAWA-17-142902MSD)	Hexachlorocyclopentadiene	23* (26%-79%)

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD met the acceptance limits.

Internal Standard (ISTD) Acceptance

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

Technical Information:

Holding Time Specifications

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

Preparation/Analytical Method Verification

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

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information:

Manual Integrations

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

TIC Comment

Tentatively identified compounds (TIC) were requested for sample 432041002 (CAWA-17-142902) 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:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
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MSD4.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP6890/HP5973	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: 2017-2640 GEL Work Order: 432041

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: 07 SEP 2017

Title: Data Validator

Sample Data Summary

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

Page 1 of 3

SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 432041002	Date Received: 09/01/2017 09:20	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142902	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 13:38	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0612.D	Column: DB-5ms	

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

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

Page 2 of 3

SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 432041002	Date Received: 09/01/2017 09:20	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142902	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 13:38	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0612.D	Column: DB-5ms	

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

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

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 432041002	Date Received: 09/01/2017 09:20	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142902	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 13:38	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0612.D	Column: DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.1	100	ug/L 79	(32%-124%)
2-Fluorobiphenyl	32.3	50.0	ug/L 65	(32%-112%)
2-Fluorophenol	49.2	100	ug/L 49	(15%-88%)
Nitrobenzene-d5	32.0	50.0	ug/L 64	(36%-115%)
Phenol-d5	27.8	100	ug/L 28	(15%-91%)
p-Terphenyl-d14	48.1	50.0	ug/L 96	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	1.73	8.1	ug/L	0	J
	unknown	1.837	7.27	ug/L	0	J
	unknown	4.179	8.62	ug/L	0	J
	unknown	4.522	4.61	ug/L	0	J

Quality Control Summary

**Semi-Volatile
Surrogate Recovery Report**

Page 1 of 1

SDG Number: 2017-2640**Matrix Type: LIQUID**

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203869938	MB for batch 1698644	48	28	63	50	77	91
1203869939	LCS for batch 1698644	53	34	74	68	99	94
432041002	CAWA-17-142902	49	28	64	65	79	96
1203869940	CAWA-17-142902MS	52	41	52	48	84	87
1203869941	CAWA-17-142902MSD	54	42	52	50	86	95

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: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698644

Matrix: WATER

Lab Sample ID 1203869939

Instrument: MSD4.I

Analysis Date: 09/06/2017 13:10

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	28.3	57	30-88
110-86-1	LCS Pyridine	50.0	0.0	30.1	60	27-89
62-53-3	LCS Aniline	50.0	0.0	38.6	77	49-112
108-95-2	LCS Phenol	50.0	0.0	18.8	38	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	39.8	80	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	38.5	77	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	30.4	61	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	31.2	62	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	32.8	66	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	40.2	80	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	39.9	80	44-102
95-48-7	LCS o-Cresol	50.0	0.0	35.6	71	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	39.4	79	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	46.8	94	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	32.3	65	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	39.3	79	53-115
78-59-1	LCS Isophorone	50.0	0.0	42.2	84	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	39.5	79	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	33.5	67	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	41.4	83	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.5	81	53-109
65-85-0	LCS Benzoic acid	100	0.0	43.3	43	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698644

Matrix: WATER

Lab Sample ID 1203869939

Instrument: MSD4.I

Analysis Date: 09/06/2017 13:10

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	51.0	102	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	31.5	63	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	48.2	96	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	34.3	69	42-103
91-20-3	LCS Naphthalene	50.0	0.0	33.9	68	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	34.9	70	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	18.2	36	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	42.3	85	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	49.4	99	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	34.6	69	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	40.4	81	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.3	95	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	44.5	89	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	44.3	89	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	46.8	94	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	37.9	76	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	41.5	83	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	43.0	86	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	38.2	76	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	46.9	94	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	47.1	94	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	14.4	29	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698644

Matrix: WATER

Lab Sample ID 1203869939

Instrument: MSD4.I

Analysis Date: 09/06/2017 13:10

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	40.3	81	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	41.9	84	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	44.8	90	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	48.3	97	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	42.0	84	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	42.4	85	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	44.4	89	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	44.4	89	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	58.6	117 *	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	42.0	84	55-110
120-12-7	LCS Anthracene	50.0	0.0	41.5	83	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	51.4	103	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	47.2	94	54-118
129-00-0	LCS Pyrene	50.0	0.0	40.0	80	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	44.9	90	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	45.4	91	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	43.7	87	57-112
218-01-9	LCS Chrysene	50.0	0.0	44.6	89	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	44.4	89	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	45.8	92	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	45.8	92	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	41.7	83	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698644

Matrix: WATER

Lab Sample ID 1203869939

Instrument: MSD4.I

Analysis Date: 09/06/2017 13:10

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	41.9	84	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	42.9	86	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	41.4	83	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	30.3	61	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	43.9	88	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	36.1	72	44-102
1912-24-9	LCS Atrazine	50.0	0.0	54.6	109	60-131
92-87-5	LCS Benzidine	100	0.0	100	100	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	48.0	96	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	31.7	63	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-2640

Sample Type: Matrix Spike

Client ID: CAWA-17-142902MS

Matrix: W

Lab Sample ID 1203869940

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	116	0.00 U	70.2	60	25-106
110-86-1	MS Pyridine	116	0.00 U	79.4	68	24-93
62-53-3	MS Aniline	116	0.00 U	86.5	74	37-113
108-95-2	MS Phenol	116	0.00 U	52.8	45	23-82
111-44-4	MS bis(2-Chloroethyl) ether	116	0.00 U	63.2	54	39-114
95-57-8	MS 2-Chlorophenol	116	0.00 U	66.0	57	37-108
541-73-1	MS 1,3-Dichlorobenzene	116	0.00 U	49.9	43	27-97
106-46-7	MS 1,4-Dichlorobenzene	116	0.00 U	50.2	43	28-97
95-50-1	MS 1,2-Dichlorobenzene	116	0.00 U	52.6	45	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	116	0.00 U	65.1	56	32-127
100-51-6	MS Benzyl alcohol	116	0.00 U	82.5	71	37-116
95-48-7	MS o-Cresol	116	0.00 U	68.2	59	34-109
65794-96-9	MS m,p-Cresols	116	0.00 U	80.4	69	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00 U	74.7	64	42-118
67-72-1	MS Hexachloroethane	116	0.00 U	51.7	44	29-94
98-95-3	MS Nitrobenzene	116	0.00 U	64.1	55	38-123
78-59-1	MS Isophorone	116	0.00 U	70.0	60	43-120
88-75-5	MS 2-Nitrophenol	116	0.00 U	64.0	55	39-115
105-67-9	MS 2,4-Dimethylphenol	116	0.00 U	59.6	51	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	116	0.00 U	67.2	58	42-118
120-83-2	MS 2,4-Dichlorophenol	116	0.00 U	68.1	59	40-111
65-85-0	MS Benzoic acid	233	0.00 U	120	52	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2640

Sample Type: Matrix Spike

Client ID: CAWA-17-142902MS

Matrix: W

Lab Sample ID 1203869940

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	116	0.00	U	108	93	44-138
87-68-3	MS	Hexachlorobutadiene	116	0.00	U	51.7	44	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00	U	88.3	76	41-122
91-57-6	MS	2-Methylnaphthalene	116	0.00	U	55.3	48	29-109
91-20-3	MS	Naphthalene	116	0.00	U	55.2	47	31-108
90-12-0	MS	1-Methylnaphthalene	116	0.00	U	56.6	49	33-112
77-47-4	MS	Hexachlorocyclopentadiene	116	0.00	U	29.0	25 *	26-79
88-06-2	MS	2,4,6-Trichlorophenol	116	0.00	U	71.0	61	39-124
95-95-4	MS	2,4,5-Trichlorophenol	116	0.00	U	87.3	75	42-120
91-58-7	MS	2-Chloronaphthalene	116	0.00	U	57.8	50	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	116	0.00	U	75.5	65	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	116	0.00	U	103	88	42-144
131-11-3	MS	Dimethylphthalate	116	0.00	U	84.0	72	45-128
606-20-2	MS	2,6-Dinitrotoluene	116	0.00	U	83.0	71	46-124
121-14-2	MS	2,4-Dinitrotoluene	116	0.00	U	94.6	81	45-125
208-96-8	MS	Acenaphthylene	116	0.00	U	62.7	54	35-120
83-32-9	MS	Acenaphthene	116	0.00	U	69.3	60	35-117
51-28-5	MS	2,4-Dinitrophenol	116	0.00	U	88.1	76	27-122
132-64-9	MS	Dibenzofuran	116	0.00	U	66.0	57	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	116	0.00	U	91.7	79	40-128
84-66-2	MS	Diethylphthalate	116	0.00	U	92.7	80	43-127
100-02-7	MS	4-Nitrophenol	116	0.00	U	67.2	58	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike

Client ID: CAWA-17-142902MS

Matrix: W

Lab Sample ID 1203869940

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	116	0.00	U	73.3	63	39-117
7005-72-3	MS	4-Chlorophenylphenylether	116	0.00	U	74.9	64	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	116	0.00	U	89.1	77	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	116	0.00	U	95.4	82	32-126
122-39-4	MS	Diphenylamine	116	0.00	U	78.8	68	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00	U	76.1	65	38-120
101-55-3	MS	4-Bromophenylphenylether	116	0.00	U	82.8	71	39-121
118-74-1	MS	Hexachlorobenzene	116	0.00	U	86.9	75	40-118
87-86-5	MS	Pentachlorophenol	116	0.00	U	117	101	35-121
85-01-8	MS	Phenanthrene	116	0.00	U	83.6	72	40-115
120-12-7	MS	Anthracene	116	0.00	U	83.4	72	38-120
84-74-2	MS	Di-n-butylphthalate	116	0.00	U	103	89	41-128
206-44-0	MS	Fluoranthene	116	0.00	U	95.7	82	41-119
129-00-0	MS	Pyrene	116	0.00	U	91.1	78	35-128
85-68-7	MS	Butylbenzylphthalate	116	0.00	U	96.8	83	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	116	0.00	U	94.0	81	38-131
56-55-3	MS	Benzo(a)anthracene	116	0.00	U	91.3	79	39-120
218-01-9	MS	Chrysene	116	0.00	U	91.7	79	41-124
117-84-0	MS	Di-n-octylphthalate	116	0.00	U	88.7	76	37-134
205-99-2	MS	Benzo(b)fluoranthene	116	0.00	U	89.6	77	31-122
207-08-9	MS	Benzo(k)fluoranthene	116	0.00	U	95.2	82	33-123
50-32-8	MS	Benzo(a)pyrene	116	0.00	U	83.3	72	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike

Client ID: CAWA-17-142902MS

Matrix: W

Lab Sample ID 1203869940

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	116	0.00 U	84.5	73	27-121
53-70-3	MS Dibenzo(a,h)anthracene	116	0.00 U	86.3	74	30-125
191-24-2	MS Benzo(ghi)perylene	116	0.00 U	82.8	71	24-126
123-91-1	MS 1,4-Dioxane	116	0.00 U	76.9	66	24-110
930-55-2	MS N-Nitrosopyrrolidine	116	0.00 U	83.1	71	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	116	0.00 U	60.3	52	32-101
1912-24-9	MS Atrazine	116	0.00 U	105	90	42-129
92-87-5	MS Benzidine	233	0.00 U	156	67	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	116	0.00 U	94.8	82	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	116	0.00 U	52.2	45	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142902MSD

Matrix: W

Lab Sample ID 1203869941

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	116	0.00	U	70.9	61	25-106	1 0-30
110-86-1	MSD Pyridine	116	0.00	U	78.0	67	24-93	2 0-30
62-53-3	MSD Aniline	116	0.00	U	89.5	77	37-113	3 0-30
108-95-2	MSD Phenol	116	0.00	U	54.4	47	23-82	3 0-30
111-44-4	MSD bis(2-Chloroethyl) ether	116	0.00	U	66.8	57	39-114	6 0-30
95-57-8	MSD 2-Chlorophenol	116	0.00	U	68.7	59	37-108	4 0-30
541-73-1	MSD 1,3-Dichlorobenzene	116	0.00	U	51.7	44	27-97	4 0-30
106-46-7	MSD 1,4-Dichlorobenzene	116	0.00	U	51.7	44	28-97	3 0-30
95-50-1	MSD 1,2-Dichlorobenzene	116	0.00	U	55.3	48	28-99	5 0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	116	0.00	U	67.6	58	32-127	4 0-30
100-51-6	MSD Benzyl alcohol	116	0.00	U	84.9	73	37-116	3 0-30
95-48-7	MSD o-Cresol	116	0.00	U	70.4	61	34-109	3 0-30
65794-96-9	MSD m,p-Cresols	116	0.00	U	85.2	73	36-120	6 0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00	U	79.0	68	42-118	5 0-30
67-72-1	MSD Hexachloroethane	116	0.00	U	54.3	47	29-94	5 0-30
98-95-3	MSD Nitrobenzene	116	0.00	U	65.7	57	38-123	2 0-30
78-59-1	MSD Isophorone	116	0.00	U	73.4	63	43-120	5 0-30
88-75-5	MSD 2-Nitrophenol	116	0.00	U	66.0	57	39-115	3 0-30
105-67-9	MSD 2,4-Dimethylphenol	116	0.00	U	60.9	52	39-107	2 0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	116	0.00	U	68.3	59	42-118	2 0-30
120-83-2	MSD 2,4-Dichlorophenol	116	0.00	U	70.7	61	40-111	4 0-30
65-85-0	MSD Benzoic acid	233	0.00	U	128	55	17-95	6 0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142902MSD

Matrix: W

Lab Sample ID 1203869941

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	116	0.00 U	109	94	44-138	1	0-30
87-68-3	MSD Hexachlorobutadiene	116	0.00 U	51.6	44	26-98	0	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00 U	92.1	79	41-122	4	0-30
91-57-6	MSD 2-Methylnaphthalene	116	0.00 U	56.7	49	29-109	2	0-30
91-20-3	MSD Naphthalene	116	0.00 U	55.6	48	31-108	1	0-30
90-12-0	MSD 1-Methylnaphthalene	116	0.00 U	58.3	50	33-112	3	0-30
77-47-4	MSD Hexachlorocyclopentadiene	116	0.00 U	27.2	23 *	26-79	6	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	116	0.00 U	75.2	65	39-124	6	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	116	0.00 U	93.2	80	42-120	6	0-30
91-58-7	MSD 2-Chloronaphthalene	116	0.00 U	59.2	51	29-113	2	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	116	0.00 U	79.1	68	41-121	5	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	116	0.00 U	105	90	42-144	2	0-30
131-11-3	MSD Dimethylphthalate	116	0.00 U	88.3	76	45-128	5	0-30
606-20-2	MSD 2,6-Dinitrotoluene	116	0.00 U	86.2	74	46-124	4	0-30
121-14-2	MSD 2,4-Dinitrotoluene	116	0.00 U	96.2	83	45-125	2	0-30
208-96-8	MSD Acenaphthylene	116	0.00 U	65.1	56	35-120	4	0-30
83-32-9	MSD Acenaphthene	116	0.00 U	71.3	61	35-117	3	0-30
51-28-5	MSD 2,4-Dinitrophenol	116	0.00 U	95.3	82	27-122	8	0-30
132-64-9	MSD Dibenzofuran	116	0.00 U	68.5	59	38-113	4	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	116	0.00 U	96.0	83	40-128	5	0-30
84-66-2	MSD Diethylphthalate	116	0.00 U	95.6	82	43-127	3	0-30
100-02-7	MSD 4-Nitrophenol	116	0.00 U	57.3	49	17-85	16	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142902MSD

Matrix: W

Lab Sample ID 1203869941

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

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	116	0.00 U	76.1	65	39-117	4	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	116	0.00 U	77.7	67	39-121	4	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	116	0.00 U	92.2	79	30-133	3	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	116	0.00 U	103	89	32-126	8	0-30
122-39-4	MSD Diphenylamine	116	0.00 U	82.5	71	37-118	5	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00 U	80.7	69	38-120	6	0-30
101-55-3	MSD 4-Bromophenylphenylether	116	0.00 U	85.7	74	39-121	3	0-30
118-74-1	MSD Hexachlorobenzene	116	0.00 U	89.7	77	40-118	3	0-30
87-86-5	MSD Pentachlorophenol	116	0.00 U	124	106	35-121	6	0-30
85-01-8	MSD Phenanthrene	116	0.00 U	86.5	74	40-115	3	0-30
120-12-7	MSD Anthracene	116	0.00 U	87.3	75	38-120	5	0-30
84-74-2	MSD Di-n-butylphthalate	116	0.00 U	107	92	41-128	4	0-30
206-44-0	MSD Fluoranthene	116	0.00 U	98.1	84	41-119	2	0-30
129-00-0	MSD Pyrene	116	0.00 U	98.8	85	35-128	8	0-30
85-68-7	MSD Butylbenzylphthalate	116	0.00 U	99.8	86	40-129	3	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	116	0.00 U	98.7	85	38-131	5	0-30
56-55-3	MSD Benzo(a)anthracene	116	0.00 U	94.5	81	39-120	3	0-30
218-01-9	MSD Chrysene	116	0.00 U	95.2	82	41-124	4	0-30
117-84-0	MSD Di-n-octylphthalate	116	0.00 U	90.0	77	37-134	1	0-30
205-99-2	MSD Benzo(b)fluoranthene	116	0.00 U	97.4	84	31-122	8	0-30
207-08-9	MSD Benzo(k)fluoranthene	116	0.00 U	97.7	84	33-123	3	0-30
50-32-8	MSD Benzo(a)pyrene	116	0.00 U	86.8	75	32-118	4	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2640

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142902MSD

Matrix: W

Lab Sample ID 1203869941

Instrument: MSD4.I

Analysis Date: 09/06/2017 14:33

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1698644

Inj. Vol: 1 uL

Batch ID: 1698645

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	116	0.00	U	87.2	75	27-121	3	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	116	0.00	U	90.0	77	30-125	4	0-30
191-24-2	MSD Benzo(ghi)perylene	116	0.00	U	84.5	73	24-126	2	0-30
123-91-1	MSD 1,4-Dioxane	116	0.00	U	78.0	67	24-110	2	0-30
930-55-2	MSD N-Nitrosopyrrolidine	116	0.00	U	88.7	76	47-119	6	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	116	0.00	U	61.9	53	32-101	3	0-30
1912-24-9	MSD Atrazine	116	0.00	U	112	96	42-129	7	0-30
92-87-5	MSD Benzidine	233	0.00	U	132	57	15-130	17	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	116	0.00	U	98.4	85	34-124	4	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	116	0.00	U	52.6	45	26-102	1	0-30

Method Blank Summary

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SDG Number:	2017-2640	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698644	Instrument ID:	MSD4.I	Data File:	s090617a.B\s4i0610.D
Lab Sample ID:	1203869938	Prep Date:	09/05/2017 19:20	Analyzed:	09/06/17 12:42
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 1698644	1203869939	s090617a.B\s4i0611.D	09/06/17	1310
02 CAWA-17-142902	432041002	s090617a.B\s4i0612.D	09/06/17	1338
03 CAWA-17-142902MS	1203869940	s090617a.B\s4i0613.D	09/06/17	1405
04 CAWA-17-142902MSD	1203869941	s090617a.B\s4i0614.D	09/06/17	1433

Quality Control Data

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

Page 1 of 3

SDG Number: 2017-2640

Lab Sample ID: 1203869938

Client Sample: QC for batch 1698644

Client ID: MB for batch 1698644

Batch ID: 1698645

Run Date: 09/06/2017 12:42

Prep Date: 09/05/2017 19:20

Data File: s090617a.B\s4i0610.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: MSD4.I
Analyst: JMB3
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	3.00	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	3.00	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
122-66-7	Azobenzene	U	3.00	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	3.00	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	3.00	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.00	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	3.00	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	3.00	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	3.00	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	3.00	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	5.00	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	3.00	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	0.410	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	3.00	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.00	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	3.00	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	3.00	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	3.00	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	3.00	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.30	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	3.00	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	3.00	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	0.300	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	0.300	ug/L	0.300	1.00
62-53-3	Aniline	U	4.20	ug/L	4.20	10.0
120-12-7	Anthracene	U	0.300	ug/L	0.300	1.00
1912-24-9	Atrazine	U	3.00	ug/L	3.00	10.0
92-87-5	Benzidine	U	3.90	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	0.300	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	0.300	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	0.300	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	0.300	ug/L	0.300	1.00

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

Page 2 of 3

SDG Number: 2017-2640

Lab Sample ID: 1203869938

Client Sample: QC for batch 1698644

Client ID: MB for batch 1698644

Batch ID: 1698645

Run Date: 09/06/2017 12:42

Prep Date: 09/05/2017 19:20

Data File: s090617a.B\s4i0610.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: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

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

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

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SDG Number: 2017-2640	Matrix: WATER
Lab Sample ID: 1203869938	
Client Sample: QC for batch 1698644	Client: ARSL004
Client ID: MB for batch 1698644	Method: SW846 3510C/8270D
Batch ID: 1698645	Inst: MSD4.I
Run Date: 09/06/2017 12:42	Analyst: JMB3
Prep Date: 09/05/2017 19:20	Aliquot: 1000 mL
Data File: s090617a.B\s4i0610.D	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
65794-96-9	m,p-Cresols	U	3.70	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.00	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.00	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	76.7	100	ug/L	77 (32%-124%)
2-Fluorobiphenyl	25.0	50.0	ug/L	50 (32%-112%)
2-Fluorophenol	47.9	100	ug/L	48 (15%-88%)
Nitrobenzene-d5	31.6	50.0	ug/L	63 (36%-115%)
Phenol-d5	28.4	100	ug/L	28 (15%-91%)
p-Terphenyl-d14	45.3	50.0	ug/L	91 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	1.73	7.25	ug/L	0	J
001569-50-2	3-Penten-2-ol	1.837	7.72	ug/L	86	NJ
	unknown	4.179	8.3	ug/L	0	J
	unknown	4.522	4.63	ug/L	0	J
000224-42-0	Dibenz[a,j]acridine	14.262	18.3	ug/L	87	NJ

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

Page 1 of 3

SDG Number: 2017-2640

Lab Sample ID: 1203869939

Client Sample: QC for batch 1698644

Client ID: LCS for batch 1698644

Batch ID: 1698645

Run Date: 09/06/2017 13:10

Prep Date: 09/05/2017 19:20

Data File: s090617a.B\s4i0611.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: MSD4.I
Analyst: JMB3
Aliquot: 1000 mL
Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		36.1	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		31.7	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		32.8	ug/L	3.00	10.0
122-66-7	Azobenzene		42.4	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		30.4	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		31.2	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		30.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		34.9	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		46.9	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		49.4	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		42.3	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.5	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		33.5	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		43.0	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		46.8	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		44.3	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		34.6	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		38.5	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		48.3	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		34.3	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		39.5	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		48.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		44.4	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		48.2	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		51.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		41.9	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		14.4	ug/L	3.00	10.0
83-32-9	Acenaphthene		41.5	ug/L	0.300	1.00
208-96-8	Acenaphthylene		37.9	ug/L	0.300	1.00
62-53-3	Aniline		38.6	ug/L	4.20	10.0
120-12-7	Anthracene		41.5	ug/L	0.300	1.00
1912-24-9	Atrazine		54.6	ug/L	3.00	10.0
92-87-5	Benzidine		100	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		43.7	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		41.7	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		45.8	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		41.4	ug/L	0.300	1.00

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

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SDG Number: 2017-2640

Lab Sample ID: 1203869939

Client Sample: QC for batch 1698644

Client ID: LCS for batch 1698644

Batch ID: 1698645

Run Date: 09/06/2017 13:10

Prep Date: 09/05/2017 19:20

Data File: s090617a.B\s4i0611.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: MSD4.I
Analyst: JMB3
Aliquot: 1000 mL
Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		45.8	ug/L	0.300	1.00
65-85-0	Benzoic acid		43.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		39.9	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		44.9	ug/L	3.00	10.0
218-01-9	Chrysene		44.6	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		51.4	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		44.4	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		42.9	ug/L	0.300	1.00
132-64-9	Dibenzofuran		38.2	ug/L	3.00	10.0
84-66-2	Diethylphthalate		47.1	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		44.5	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		42.0	ug/L	3.00	10.0
206-44-0	Fluoranthene		47.2	ug/L	0.300	1.00
86-73-7	Fluorene		40.3	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		44.4	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		31.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		18.2	ug/L	3.00	10.0
67-72-1	Hexachloroethane		32.3	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		41.9	ug/L	0.300	1.00
78-59-1	Isophorone		42.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		28.3	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		46.8	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		43.9	ug/L	3.00	10.0
91-20-3	Naphthalene		33.9	ug/L	0.300	1.00
98-95-3	Nitrobenzene		39.3	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		58.6	ug/L	3.00	10.0
85-01-8	Phenanthrene		42.0	ug/L	0.300	1.00
108-95-2	Phenol		18.8	ug/L	3.00	10.0
129-00-0	Pyrene		40.0	ug/L	0.300	1.00
110-86-1	Pyridine		30.1	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		40.2	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		41.4	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		39.8	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		45.4	ug/L	3.00	10.0

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SDG Number: 2017-2640	Matrix: WATER
Lab Sample ID: 1203869939	
Client Sample: QC for batch 1698644	Client: ARSL004
Client ID: LCS for batch 1698644	Method: SW846 3510C/8270D
Batch ID: 1698645	Inst: MSD4.I
Run Date: 09/06/2017 13:10	Analyst: JMB3
Prep Date: 09/05/2017 19:20	Aliquot: 1000 mL
Data File: s090617a.B\s4i0611.D	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
65794-96-9	m,p-Cresols		39.4	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.3	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		35.6	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		40.4	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		44.8	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	99.4	100	ug/L	99	(32%-124%)
2-Fluorobiphenyl	34.2	50.0	ug/L	68	(32%-112%)
2-Fluorophenol	52.9	100	ug/L	53	(15%-88%)
Nitrobenzene-d5	36.8	50.0	ug/L	74	(36%-115%)
Phenol-d5	34.3	100	ug/L	34	(15%-91%)
p-Terphenyl-d14	46.8	50.0	ug/L	94	(36%-121%)

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869940	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:05	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0613.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		60.3	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		52.2	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		52.6	ug/L	6.98	23.3
122-66-7	Azobenzene		76.1	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		49.9	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		50.2	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		76.9	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		56.6	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		91.7	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		87.3	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		71.0	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		68.1	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		59.6	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		88.1	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		94.6	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		83.0	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		57.8	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		66.0	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		95.4	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		55.3	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		64.0	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		94.8	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		82.8	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		88.3	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		108	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		74.9	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		67.2	ug/L	6.98	23.3
83-32-9	Acenaphthene		69.3	ug/L	0.698	2.33
208-96-8	Acenaphthylene		62.7	ug/L	0.698	2.33
62-53-3	Aniline		86.5	ug/L	9.77	23.3
120-12-7	Anthracene		83.4	ug/L	0.698	2.33
1912-24-9	Atrazine		105	ug/L	6.98	23.3
92-87-5	Benzidine		156	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		91.3	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		83.3	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		89.6	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		82.8	ug/L	0.698	2.33

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869940	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:05	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0613.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		95.2	ug/L	0.698	2.33
65-85-0	Benzoic acid		120	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		82.5	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		96.8	ug/L	6.98	23.3
218-01-9	Chrysene		91.7	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		103	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		88.7	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		86.3	ug/L	0.698	2.33
132-64-9	Dibenzofuran		66.0	ug/L	6.98	23.3
84-66-2	Diethylphthalate		92.7	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		84.0	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		78.8	ug/L	6.98	23.3
206-44-0	Fluoranthene		95.7	ug/L	0.698	2.33
86-73-7	Fluorene		73.3	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		86.9	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		51.7	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		29.0	ug/L	6.98	23.3
67-72-1	Hexachloroethane		51.7	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		84.5	ug/L	0.698	2.33
78-59-1	Isophorone		70.0	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		70.2	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		74.7	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		83.1	ug/L	6.98	23.3
91-20-3	Naphthalene		55.2	ug/L	0.698	2.33
98-95-3	Nitrobenzene		64.1	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		117	ug/L	6.98	23.3
85-01-8	Phenanthrene		83.6	ug/L	0.698	2.33
108-95-2	Phenol		52.8	ug/L	6.98	23.3
129-00-0	Pyrene		91.1	ug/L	0.698	2.33
110-86-1	Pyridine		79.4	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		65.1	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		67.2	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		63.2	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		94.0	ug/L	6.98	23.3

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869940	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:05	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0613.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		80.4	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		103	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		68.2	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		75.5	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		89.1	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	195	233	ug/L	84 (32%-124%)
2-Fluorobiphenyl	55.4	116	ug/L	48 (32%-112%)
2-Fluorophenol	120	233	ug/L	52 (15%-88%)
Nitrobenzene-d5	60.5	116	ug/L	52 (36%-115%)
Phenol-d5	95.0	233	ug/L	41 (15%-91%)
p-Terphenyl-d14	101	116	ug/L	87 (36%-121%)

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869941	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:33	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0614.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		61.9	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		52.6	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		55.3	ug/L	6.98	23.3
122-66-7	Azobenzene		80.7	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		51.7	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		51.7	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		78.0	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		58.3	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		96.0	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		93.2	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		75.2	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		70.7	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		60.9	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		95.3	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		96.2	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		86.2	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		59.2	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		68.7	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		103	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		56.7	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		66.0	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		98.4	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		85.7	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		92.1	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		109	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		77.7	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		57.3	ug/L	6.98	23.3
83-32-9	Acenaphthene		71.3	ug/L	0.698	2.33
208-96-8	Acenaphthylene		65.1	ug/L	0.698	2.33
62-53-3	Aniline		89.5	ug/L	9.77	23.3
120-12-7	Anthracene		87.3	ug/L	0.698	2.33
1912-24-9	Atrazine		112	ug/L	6.98	23.3
92-87-5	Benzidine		132	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		94.5	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		86.8	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		97.4	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		84.5	ug/L	0.698	2.33

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869941	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:33	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0614.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		97.7	ug/L	0.698	2.33
65-85-0	Benzoic acid		128	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		84.9	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		99.8	ug/L	6.98	23.3
218-01-9	Chrysene		95.2	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		107	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		90.0	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		90.0	ug/L	0.698	2.33
132-64-9	Dibenzofuran		68.5	ug/L	6.98	23.3
84-66-2	Diethylphthalate		95.6	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		88.3	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		82.5	ug/L	6.98	23.3
206-44-0	Fluoranthene		98.1	ug/L	0.698	2.33
86-73-7	Fluorene		76.1	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		89.7	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		51.6	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		27.2	ug/L	6.98	23.3
67-72-1	Hexachloroethane		54.3	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		87.2	ug/L	0.698	2.33
78-59-1	Isophorone		73.4	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		70.9	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		79.0	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		88.7	ug/L	6.98	23.3
91-20-3	Naphthalene		55.6	ug/L	0.698	2.33
98-95-3	Nitrobenzene		65.7	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		124	ug/L	6.98	23.3
85-01-8	Phenanthrene		86.5	ug/L	0.698	2.33
108-95-2	Phenol		54.4	ug/L	6.98	23.3
129-00-0	Pyrene		98.8	ug/L	0.698	2.33
110-86-1	Pyridine		78.0	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		67.6	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		68.3	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		66.8	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		98.7	ug/L	6.98	23.3

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SDG Number: 2017-2640	Date Collected: 08/30/2017 11:47	Matrix: W
Lab Sample ID: 1203869941	Date Received: 09/01/2017 09:20	
Client Sample: QC for batch 1698644	Client: ARSL004	Project: QC
Client ID: CAWA-17-142902MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1698645	Inst: MSD4.I	Dilution: 1
Run Date: 09/06/2017 14:33	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/05/2017 19:20	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s090617a.B\s4i0614.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		85.2	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		105	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		70.4	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		79.1	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		92.2	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	201	233	ug/L	86	(32%-124%)
2-Fluorobiphenyl	57.7	116	ug/L	50	(32%-112%)
2-Fluorophenol	126	233	ug/L	54	(15%-88%)
Nitrobenzene-d5	60.0	116	ug/L	52	(36%-115%)
Phenol-d5	97.2	233	ug/L	42	(15%-91%)
p-Terphenyl-d14	111	116	ug/L	95	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2640
Work Order #: 432041**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1698696

Prep Batch Number: 1698687

Sample Analysis

Sample ID	Client ID
432041001	432041001 (CAWA-17-142867)
1203870076	Interference Check Sample (ICS)
1203870071	Method Blank (MB)
1203870072	Laboratory Control Sample (LCS)
1203870073	431853001(CAPA-17-142931) Matrix Spike (MS)
1203870074	431853001(CAPA-17-142931) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

Calibration Blanks must be designated as IPB001.

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

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

Matrix Spike (MS) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

The internal standard areas were within the required acceptance criteria for all samples and QC.

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by DOD QSM 5.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Method Comments

The samples in this SDG were not originally analyzed using EPA Method 314.0.

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value. The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred. Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are internally corrected for using Perchlorate-O (18).

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples. Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with a Micromass Quattro Ultima Mass Spectrometer/Mass Spectrometer. It is designated as LCMSMS #2. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis. The laboratory may also utilize an Agilent 1100 liquid chromatography instrument for Perchlorate analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/Mass Spectrometer, designated as LCMSMS #3 or LCMSMS #4. It is also fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

Electronic Packaging Comment

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

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

Chromatographic Columns

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

Chromatographic separation of Perchlorate is accomplished through analysis on the following anion column:

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2640 GEL Work Order: 432041

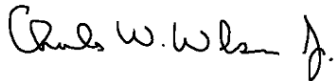
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Charles Wilson

Date: 09 SEP 2017

Title: Analyst II

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142867Date Received: 01-SEP-17GEL Job No (SDG): 2017-2640GEL Sample ID: 432041001Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.492	ug/L		1	06-SEP-17 22:40	per0906040a
	Perchlorate Isotope Ratio			3.08			1	06-SEP-17 22:40	per0906040a
14797-73-0	Perchlorate-101	.05	.2	0.465	ug/L		1	06-SEP-17 22:40	per0906040a
	Perchlorate-O(18)			0.421	ug/L		1	06-SEP-17 22:40	per0906040a

^ 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): 2017-2640

Extract Batch Code: 1698687

Date Filtered: 06-SEP-17

Matrix: WATER

Sample ID: 1203870072

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

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-2640

Extract Batch Code: 1698687

Date Extracted: 06-SEP-17

GEL MS/PS ID: 1203870073

Client ID: CAPA-17-142931

GEL MSD/PSD ID: 1203870074

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.750	ug/L	0.943	96	1	125	6	30	75 - 125
Perchlorate Isotope Ratio	0	2.88		2.68		2.89		8		-
Perchlorate-101	0.200	0.756	ug/L	1.02	133 *	1.01	125	2	30	75 - 125
Perchlorate-O(18)	0	0.470	ug/L	0.445		.45		1		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 06-SEP-17GEL Job No (SDG): 2017-2640GEL Sample ID: 1203870071Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	06-SEP-17 20:26	per0906025a
	Perchlorate Isotope Ratio						1	06-SEP-17 20:26	per0906025a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	06-SEP-17 20:26	per0906025a
	Perchlorate-O(18)			0.495	ug/L		1	06-SEP-17 20:26	per0906025a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 06-SEP-17GEL Job No (SDG): 2017-2640GEL Sample ID: 1203870072Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.211	ug/L		1	06-SEP-17 20:35	per0906026a
	Perchlorate Isotope Ratio			2.8			1	06-SEP-17 20:35	per0906026a
14797-73-0	Perchlorate-101	.05	.2	0.219	ug/L		1	06-SEP-17 20:35	per0906026a
	Perchlorate-O(18)			0.455	ug/L		1	06-SEP-17 20:35	per0906026a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-2640GEL Sample ID: 1203870076Date Filtered: 06-SEP-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.242	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate Isotope Ratio			2.94			1	06-SEP-17 20:44	per0906027a
14797-73-0	Perchlorate-101	.05	.2	0.239	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate-O(18)			0.451	ug/L		1	06-SEP-17 20:44	per0906027a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDate Received: 31-AUG-17GEL Job No (SDG): 2017-2640GEL Sample ID: 1203870073Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.943	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate Isotope Ratio			2.68			1	06-SEP-17 21:02	per0906029a
14797-73-0	Perchlorate-101	.05	.2	1.02	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate-O(18)			0.445	ug/L		1	06-SEP-17 21:02	per0906029a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDDate Received: 31-AUG-17GEL Job No (SDG): 2017-2640GEL Sample ID: 1203870074Date Filtered: 06-SEP-17Injection Volume (uL): 20%Solids:

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

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

*Concentration =

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

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2640
Work Order #: 432041**

Method/Analysis Information

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1698678

Prep Batch Number: 1698677

Sample Analysis

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

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-068 REV# 7.

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

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

Calibration Blank Requirements

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

CRI Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

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

Matrix Spike (MS) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

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

Internal Standard (ISTD) Acceptance

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. Sample 432041003 (CAWA-17-142902) 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.

Analyte	432041
	003
RDX	5X

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct. Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data. Relative Retention Time (RRT) is used by the laboratory to establish peak identity. The RRT of each target analyte is calculated using the retention time of the corresponding internal standard. The RRT of each analyte in a sample must be within 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: 2017-2640 GEL Work Order: 432041

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: 14 SEP 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 432041003

Sample Amount 950 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907029.wiff

Date Analyzed: 08-SEP-17 02:18

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	.0842	U	0.0842	0.263
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.0842	U	0.0842	0.263
<i>13980-04-6</i>	<i>TNX</i>				
479-45-8	Tetryl	.0842	U	0.0842	0.526
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	.0842	U	0.0842	0.263
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0842	U	0.0842	0.263
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0842	U	0.0842	0.263
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0842	U	0.0842	0.263
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0842	U	0.0842	0.263
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.0842	U	0.0842	0.263
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0863	U	0.0863	0.263
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	.0897	J	0.0842	0.263
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	.105	U	0.105	0.526
<i>78-11-5</i>	<i>PETN</i>				
5755-27-1	MNX	.12	J	0.0842	0.263
<i>5755-27-1</i>	<i>MNX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 432041003

Sample Amount 950 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.158	U	0.158	0.526
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.316	U	0.316	1.05
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.316	U	0.316	1.05
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.316	U	0.316	1.05
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.358		0.0842	0.263
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.372		0.0842	0.263
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.526	U	0.526	2.63
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.526	U	0.526	2.63
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	1.23		0.0842	0.263
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142902

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 432041003

Sample Amount 950 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907063.wiff

Date Analyzed: 08-SEP-17 22:24

Dilution Factor: 5

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	20		0.211	0.658
121-82-4	RDX				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-2640**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
432041003	CAWA-17-142902	100	55 - 115	
432041003	CAWA-17-142902DL	83	55 - 115	
1203870022	MB for batch 1698677	86	55 - 115	
1203870023	LCS for batch 1698677	86	55 - 115	
1203870024	CAWA-17-142902MS	88	55 - 115	
1203870025	CAWA-17-142902MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Extract Batch Code: 1698677

Date Extracted: 06-SEP-17

GEL LCS ID: 1203870023

GEL LCSDUP ID: .

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

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

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

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-142902

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Extract Batch Code: 1698677

Date Extracted: 06-SEP-17

GEL Spike ID: 1203870024

GEL SpikeDup ID: 1203870025

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

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

Reporting Units: ug/L

QC Type: MS/MSD

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

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870022

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907026.wiff

Date Analyzed: 08-SEP-17 00:31

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870022

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870023

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907027.wiff

Date Analyzed: 08-SEP-17 01:07

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1698677

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870023

Sample Amount 1000 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870024

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907030.wiff

Date Analyzed: 08-SEP-17 02:53

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870024

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870025

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0907031.wiff

Date Analyzed: 08-SEP-17 03:29

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-2640

Matrix: WATER

GEL Sample ID: 1203870025

Sample Amount 920 mL

Date Received: 01-SEP-17

Moisture: .

Extraction Batch ID: 1698677

Extraction Type Sol Exchange

Date Extracted: 06-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2640Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 07-SEP-17 09:45GEL Data File: EXP0907001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	376.91
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
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
PETN	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2640Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 07-SEP-17 10:20GEL Data File: EXP0907002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 07-SEP-17 15:04

GEL Data File: EXP0907010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
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): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 07-SEP-17 17:26

GEL Data File: EXP0907014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 07-SEP-17 22:09

GEL Data File: EXP0907022.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 07-SEP-17 23:20

GEL Data File: EXP0907024.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 08-SEP-17 07:02

GEL Data File: EXP0907037.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 08-SEP-17 12:56

GEL Data File: EXP0907047.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 08-SEP-17 14:07

GEL Data File: EXP0907049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 08-SEP-17 15:54

GEL Data File: EXP0907052.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	5.61
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): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 08-SEP-17 17:40

GEL Data File: EXP0907055.wiff

Instrument ID: LCMSMS5

Column: 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
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): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 08-SEP-17 18:16

GEL Data File: EXP0907056.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 08-SEP-17 19:27

GEL Data File: EXP0907058.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
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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 08-SEP-17 20:38

GEL Data File: EXP0907060.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
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
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 08-SEP-17 22:59

GEL Data File: EXP0907064.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK15

Analysis Date: 09-SEP-17 03:08

GEL Data File: EXP0907071.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
PETN	0	0
RDX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2640

Lab Code: GEL

Lab Sample ID: XIBLK16

Analysis Date: 09-SEP-17 04:19

GEL Data File: EXP0907073.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2640
Work Order #: 432041

Sample ID	Client ID
432041001	CAWA-17-142867
432041003	CAWA-17-142902
1203868279	Method Blank (MB) ICP
1203868280	Laboratory Control Sample (LCS)
1203868283	432041001(CAWA-17-142867L) Serial Dilution (SD)
1203868281	432041001(CAWA-17-142867D) Sample Duplicate (DUP)
1203868282	432041001(CAWA-17-142867S) Matrix Spike (MS)
1203868254	Method Blank (MB) ICP-MS
1203868255	Laboratory Control Sample (LCS)
1203868258	432041001(CAWA-17-142867L) Serial Dilution (SD)
1203868256	432041001(CAWA-17-142867D) Sample Duplicate (DUP)
1203868257	432041001(CAWA-17-142867S) Matrix Spike (MS)
1203874699	Method Blank (MB) CVAA
1203874700	Laboratory Control Sample (LCS)
1203874703	432041001(CAWA-17-142867L) Serial Dilution (SD)
1203874701	432041001(CAWA-17-142867D) Sample Duplicate (DUP)
1203874702	432041001(CAWA-17-142867S) Matrix Spike (MS)

Sample Analysis

Samples 432041001 and 003 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1697911, 1697899, 1700519 and 1704101
Prep Batch :	1697910, 1697898 and 1700517
Standard Operating Procedures:	GL-MA-E-013 REV# 29, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 31, GL-MA-E-010 REV# 35 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria. 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: 432041001 (CAWA-17-142867)-ICP, ICP-MS and 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.

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: 2017-2640 GEL Work Order: 432041

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 28 SEP 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2640**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 432041001**BASIS:** As Received**DATE COLLECTED** 30-AUG-17**CLIENT ID:** CAWA-17-142867**LEVEL:** Low**DATE RECEIVED** 01-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/15/17 10:07	091517W2-12	1700519

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2640

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 432041001

BASIS: As Received

DATE COLLECTED 30-AUG-17

CLIENT ID: CAWA-17-142867

LEVEL: Low

DATE RECEIVED 01-SEP-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	09/18/17 11:32	170918-3	1697899
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-39-3	Barium	4.63	ug/L	J	1	5	5	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-42-8	Boron	30.3	ug/L	J	15	50	50	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-70-2	Calcium	14200	ug/L		50	200	200	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7439-95-4	Magnesium	4530	ug/L		110	300	300	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7439-98-7	Molybdenum	0.899	ug/L		0.2	0.5	0.5	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-02-0	Nickel	0.620	ug/L	J	0.6	2	2	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-09-7	Potassium	1780	ug/L		50	150	150	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7631-86-9	Silica	44300	ug/L		53	213	213	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-23-5	Sodium	14100	ug/L		100	300	300	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-24-6	Strontium	85.8	ug/L		1	5	5	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	09/15/17 18:39	170915-2	1697899
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-61-1	Uranium	0.671	ug/L		0.067	0.2	0.2	1	MS	BAJ	09/18/17 16:02	170918-11	1697899
7440-62-2	Vanadium	1.4	ug/L	J	1	5	5	1	P	JWJ	09/19/17 14:13	091917-1	1697911
7440-66-6	Zinc	3.8	ug/L	J	3.3	10	10	1	P	JWJ	09/19/17 14:13	091917-1	1697911

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2640**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 432041001**BASIS:** As Received**DATE COLLECTED** 30-AUG-17**CLIENT ID:** CAWA-17-142867**LEVEL:** Low**DATE RECEIVED** 01-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	54.2	mg/L		0.453	1.24	1.24	1		TXT1	09/26/17 17:03		1704101

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1697899	1697898	SW846 3005A	50	mL	50	mL	09/05/17	JXM8
1697911	1697910	SW846 3005A	50	mL	50	mL	09/06/17	JXM8
1700519	1700517	EPA 245.1/245.2 Prep	20	mL	20	mL	09/14/17	AXS5

***Analytical Methods:**

P SW846 3005A/6010C
MS SW846 3005A/6020A
AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2640**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 432041003**BASIS:** As Received**DATE COLLECTED** 30-AUG-17**CLIENT ID:** CAWA-17-142902**LEVEL:** Low**DATE RECEIVED** 01-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/15/17 10:15	091517W2-12	1700519

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1700519	1700517	EPA 245.1/245.2 Prep	20	mL	20	mL	09/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2640

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>
1203868254	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203868279	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.41	ug/L	+/-10	J	P	3.3	10
1203874699	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. 2017-2640 Client ID CAWA-17-142867S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 432041001 Spike ID: 1203868257

<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	48.2		1	U	50	95.7		MS
Arsenic	ug/L	75-125	51.5		2	U	50	100		MS
Cadmium	ug/L	75-125	49.4		0.3	U	50	98.7		MS
Chromium	ug/L	75-125	51.1		3	U	50	99.9		MS
Lead	ug/L	75-125	48.5		0.5	U	50	96.9		MS
Molybdenum	ug/L	75-125	51.9		0.899		50	102		MS
Nickel	ug/L	75-125	52.4		0.62	J	50	103		MS
Selenium	ug/L	75-125	50.1		2	U	50	99		MS
Silver	ug/L	75-125	50.3		0.3	U	50	101		MS
Thallium	ug/L	75-125	47.4		0.6	U	50	94.8		MS
Uranium	ug/L	75-125	50.9		0.671		50	100		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2640 Client ID: CAWA-17-142867S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 432041001 Spike ID: 1203868282

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Potassium	ug/L	75-125	6560		1780		5000	95.6		P
Silica	ug/L		54300		44300		10700	93	N/A	P
Sodium	ug/L	75-125	19300		14100		5000	105		P
Strontium	ug/L	75-125	564		85.8		500	95.6		P
Tin	ug/L	75-125	465		2.5	U	500	92.8		P
Vanadium	ug/L	75-125	484		1.4	J	500	96.6		P
Zinc	ug/L	75-125	481		3.8	J	500	95.5		P
Manganese	ug/L	75-125	470		2	U	500	94		P
Aluminum	ug/L	75-125	4900		68	U	5000	98		P
Barium	ug/L	75-125	475		4.63	J	500	94		P
Beryllium	ug/L	75-125	475		1	U	500	94.9		P
Boron	ug/L	75-125	512		30.3	J	500	96.3		P
Calcium	ug/L	75-125	19100		14200		5000	97.8		P
Cobalt	ug/L	75-125	482		1	U	500	96.2		P
Copper	ug/L	75-125	484		3	U	500	96.7		P
Iron	ug/L	75-125	4880		30	U	5000	97.3		P
Magnesium	ug/L	75-125	9670		4530		5000	103		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2640 **Client ID:** CAWA-17-142867S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 432041001 **Spike ID:** 1203874702

<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	2.01		0.067	U	2	101		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2640

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142867D

Matrix: WATER

Level: Low

Sample ID: 432041001

Duplicate ID: 1203868256

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	0.899		0.983		8.93		MS
Nickel	ug/L	+/- 2	0.62 J		0.612 J		1.3		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	0.671		0.671		0		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2640

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142867D

Matrix: WATER

Level: Low

Sample ID: 432041001

Duplicate ID: 1203868281

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	4.63 J		4.51 J		2.66		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	30.3 J		29.9 J		1.09		P
Calcium	ug/L	+/-20%	14200		14100		1.07		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	4530		4490		.848		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1780		1770		.332		P
Silica	ug/L	+/-20%	44300		44100		.418		P
Sodium	ug/L	+/-20%	14100		14000		.725		P
Strontium	ug/L	+/-20%	85.8		85.8		.0792		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	1.4 J		1.16 J		18.5		P
Zinc	ug/L	+/-10	3.8 J		3.85 J		1.23		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017–2640**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–17–142867D**Matrix:** WATER**Level:** Low**Sample ID:** 432041001**Duplicate ID:** 1203874701**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. 2017-2640

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>
1203868255								
	Antimony	ug/L	50	51.2		102	80-120	MS
	Arsenic	ug/L	50	52.5		105	80-120	MS
	Cadmium	ug/L	50	51.8		104	80-120	MS
	Chromium	ug/L	50	49.6		99.2	80-120	MS
	Lead	ug/L	50	49.1		98.2	80-120	MS
	Molybdenum	ug/L	50	49.8		99.5	80-120	MS
	Nickel	ug/L	50	53.7		107	80-120	MS
	Selenium	ug/L	50	52.5		105	80-120	MS
	Silver	ug/L	50	49.8		99.7	80-120	MS
	Thallium	ug/L	50	48.2		96.4	80-120	MS
	Uranium	ug/L	50	52.8		106	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2640

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203868280								
	Aluminum	ug/L	5000	5330		107	80-120	P
	Barium	ug/L	500	503		101	80-120	P
	Beryllium	ug/L	500	495		98.9	80-120	P
	Boron	ug/L	500	497		99.4	80-120	P
	Calcium	ug/L	5000	5360		107	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	507		101	80-120	P
	Iron	ug/L	5000	5280		106	80-120	P
	Magnesium	ug/L	5000	5420		108	80-120	P
	Manganese	ug/L	500	505		101	80-120	P
	Potassium	ug/L	5000	5170		103	80-120	P
	Silica	ug/L	10700	10300		95.8	80-120	P
	Sodium	ug/L	5000	5180		104	80-120	P
	Strontium	ug/L	500	513		103	80-120	P
	Tin	ug/L	500	486		97.2	80-120	P
	Vanadium	ug/L	500	504		101	80-120	P
	Zinc	ug/L	500	508		102	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2640

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>
1203874700	Mercury	ug/L	2	2.08		104	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2640

Client ID: CAWA-17-142867L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 432041001

Serial Dilution ID: 1203868258

<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	.899		1	U	3.782			MS
Nickel	.62	J	3	U	88.71			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.671		.65	J	3.13			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2640 Client ID: CAWA-17-142867L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 432041001 Serial Dilution ID: 1203868283

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	4.63	J	5	U	3.534			P
Beryllium	1	U	5	U				P
Boron	30.3	J	75	U	63.968			P
Calcium	14200		15100		5.909		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	4530		4820		6.451			P
Manganese	2	U	10	U				P
Potassium	1780		1840		3.572			P
Silica	44300		46700		5.437		10	P
Sodium	14100		15400		8.779		10	P
Strontium	85.8		90.9		6.016		10	P
Tin	2.5	U	12.5	U				P
Vanadium	1.4	J	5	U	18.489			P
Zinc	3.8	J	16.5	U	226.526			P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2640 **Client ID:** CAWA-17-142867L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 432041001 **Serial Dilution ID:** 1203874703

<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 #: 2017-2640
Work Order #: 432041**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1699093

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
432041003	CAWA-17-142902
1203871102	Method Blank (MB)
1203871103	Laboratory Control Sample (LCS)
1203871104	431769002(NonSDG) Sample Duplicate (DUP)
1203871105	432105005(CAPA-17-142934) Sample Duplicate (DUP)
1203871107	431769002(NonSDG) Post Spike (PS)
1203871108	432105005(CAPA-17-142934) 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

Samples 431769002 (NonSDG) and 432105005 (CAPA-17-142934) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203871104 (Non SDG 431769002DUP) and 1203871107 (Non SDG 431769002PS) in this sample group were diluted due to matrix interference. 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.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1697937	Method:	WSP-CN(T)
Prep Batch :	1697936	Method:	EPA 335.4

Sample Analysis

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

Sample ID	Client ID
432041003	CAWA-17-142902
1203868313	Method Blank (MB)
1203868314	Laboratory Control Sample (LCS)
1203868315	432041003(CAWA-17-142902) Sample Duplicate (DUP)
1203868317	432041003(CAWA-17-142902) 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# 20.

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 432041003 (CAWA-17-142902) 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

Sample1203868315 (CAWA-17-142902DUP) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1699852

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203872821	Method Blank (MB)
1203872822	Laboratory Control Sample (LCS)
1203872823	432546001(CrIN1-17-145287) Sample Duplicate (DUP)
1203872824	432546001(CrIN1-17-145287) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following sample 432041001 (CAWA-17-142867) was 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	432041
	001
Chloride	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203872823 (CrIN1-17-145287DUP), 1203872824 (CrIN1-17-145287PS) and 432041001 (CAWA-17-142867) 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:	1698259	Method:	NH3
Prep Batch :	1698258	Method:	EPA 350.1 Prep

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203868979	Method Blank (MB)
1203868980	Laboratory Control Sample (LCS)
1203868982	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203868984	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) 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**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1698312	Method:	TKN
Prep Batch :	1698311	Method:	EPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
432041003	CAWA-17-142902
1203869129	Method Blank (MB)
1203869130	Laboratory Control Sample (LCS)
1203869131	431899001(WST35-17-144895) Sample Duplicate (DUP)
1203869132	431899001(WST35-17-144895) 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 431899001 (WST35-17-144895) 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	1203869132 (WST35-17-144895MS)	72* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1698270

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203869019	Method Blank (MB)
1203869020	Laboratory Control Sample (LCS)
1203869021	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203869024	431850001(WST35-17-144903) 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# 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+ 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 431850001 (WST35-17-144903) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1698269	Method:	PO4
Prep Batch :	1698268	Method:	EPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203869009	Method Blank (MB)
1203869010	Laboratory Control Sample (LCS)
1203869011	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203869015	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1698443

Method: TDS

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203869513	Method Blank (MB)
1203869514	Laboratory Control Sample (LCS)
1203869517	432041001(CAWA-17-142867) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 432041001 (CAWA-17-142867) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Total Dissolved Solids	1203869517 (CAWA-17-142867DUP)	6.74* (0%-5%)

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1701648

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203877744	Laboratory Control Sample (LCS)
1203877745	431853001(CAPA-17-142931) Sample Duplicate (DUP)
1203877746	432189001(CAWA-17-142859) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1698844 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203870477	Laboratory Control Sample (LCS)
1203871261	432105009(CAWA-17-142881) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203871261 (CAWA-17-142881DUP)	pH	Received 02-SEP-17, out of holding 31-AUG-17
432041001 (CAWA-17-142867)	pH	Received 01-SEP-17, out of holding 30-AUG-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1698841 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
432041001	CAWA-17-142867
1203870470	Laboratory Control Sample (LCS)
1203870473	432105009(CAWA-17-142881) Sample Duplicate (DUP)
1203870475	432105009(CAWA-17-142881) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

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: 2017-2640 GEL Work Order: 432041

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 25 SEP 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 25, 2017

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

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

Client SDG: 2017-2640

Client Sample ID: CAWA-17-142867
Sample ID: 432041001
Matrix: W
Collect Date: 30-AUG-17 11:47
Receive Date: 01-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.164	0.067	0.200	mg/L		1	MXL2	09/12/17	1657	1699852	1
Fluoride	J	0.0782	0.033	0.100	mg/L		1					
Sulfate		7.57	0.133	0.400	mg/L		1					
Chloride		12.3	0.134	0.400	mg/L		2	MXL2	09/13/17	2228	1699852	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0334	0.017	0.050	mg/L	1.00	1	KLP1	09/05/17	1100	1698259	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.13	0.017	0.050	mg/L		1	AXH3	09/05/17	1031	1698270	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.0404	0.020	0.050	mg/L	1.00	1	KLP1	09/06/17	0842	1698269	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		129	3.40	14.3	mg/L			KLP1	09/06/17	1530	1698443	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		64.9	1.45	4.00	mg/L			RXB5	09/07/17	1636	1698841	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		201	1.00	1.00	umhos/cm		1	VH1	09/20/17	1509	1701648	8
PH "As Received"												
pH at Temp 12.0C	H	7.30	0.010	0.100	SU		1	RXB5	09/07/17	1652	1698844	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/05/17	0845	1698258
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	09/05/17	1230	1698268

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 25, 2017

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

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

Client SDG: 2017-2640

Client Sample ID: CAWA-17-142867
Sample ID: 432041001

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

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

Certificate of Analysis

Report Date: September 25, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2017-2640

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-142902

Project: ESHL00114

Sample ID: 432041003

Client ID: ARSL004

Matrix: W

Collect Date: 30-AUG-17 11:47

Receive Date: 01-SEP-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		1.01	0.330	1.00	mg/L		1	TSM	09/13/17	0559	1699093	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/06/17	0818	1697937	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	09/07/17	1521	1698312	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/06/17	0712	1697936
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	09/07/17	1000	1698311

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 25, 2017

Page 1 of 6

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

Contact: Ms. Nita Patel

Workorder: 432041

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1699093										
QC1203871104	431769002	DUP									
Total Organic Carbon Average		12.1		11.8	mg/L	2.14		(0%-20%)	TSM	09/12/17	22:10
QC1203871105	432105005	DUP									
Total Organic Carbon Average	U	ND	U	ND	mg/L	N/A				09/13/17	08:43
QC1203871103	LCS										
Total Organic Carbon Average	10.0			10.4	mg/L		104	(80%-120%)		09/12/17	21:35
QC1203871102	MB										
Total Organic Carbon Average			J	0.673	mg/L					09/12/17	21:23
QC1203871107	431769002	PS									
Total Organic Carbon Average	10.0		6.05	16.5	mg/L		105	(75%-125%)		09/12/17	22:33
QC1203871108	432105005	PS									
Total Organic Carbon Average	10.0	U	ND	10.9	mg/L		105	(75%-125%)		09/13/17	09:30
Flow Injection Analysis											
Batch	1697937										
QC1203868315	432041003	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	09/06/17	08:43
QC1203868314	LCS										
Cyanide, Total	50.0			51.7	ug/L		103	(90%-110%)		09/06/17	08:07
QC1203868313	MB										
Cyanide, Total			U	ND	ug/L					09/06/17	08:06
QC1203868317	432041003	MS									
Cyanide, Total	100	U	ND	97.2	ug/L		97.2	(90%-110%)		09/06/17	08:20

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
QC1203872823	432546001	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	09/12/17	19:51
Chloride			6.99		6.98	mg/L	0.146	(0%-20%)			
Fluoride			0.290		0.294	mg/L	1.37 ^	(+/-0.100)			
Sulfate			9.17		9.19	mg/L	0.245	(0%-20%)			
QC1203872822	LCS										
Bromide		1.25			1.18	mg/L	94.1	(80%-120%)		09/12/17	13:35
Chloride		5.00			4.76	mg/L	95.2	(80%-120%)			
Fluoride		2.50			2.37	mg/L	94.7	(80%-120%)			
Sulfate		10.0			9.49	mg/L	94.9	(80%-120%)			
QC1203872821	MB										
Bromide			U		ND	mg/L				09/12/17	13:06
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203872824	432546001	PS									
Bromide		1.25	U		1.28	mg/L	97.2	(75%-125%)		09/12/17	20:20
Chloride		5.00		6.99	12.5	mg/L	110	(75%-125%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
Fluoride	2.50	0.290		2.67	mg/L		95.3	(75%-125%)	MXL2	09/12/17	20:20
Sulfate	10.0	9.17		19.7	mg/L		105	(75%-125%)			
Nutrient Analysis											
Batch	1698259										
QC1203868982	431850001	DUP									
Nitrogen, Ammonia		0.496		0.504	mg/L	1.6		(0%-20%)	KLP1	09/05/17	10:46
QC1203868980	LCS										
Nitrogen, Ammonia	1.00			0.918	mg/L		91.8	(90%-110%)		09/05/17	10:41
QC1203868979	MB										
Nitrogen, Ammonia			U	ND	mg/L					09/05/17	10:41
QC1203868984	431850001	MS									
Nitrogen, Ammonia	1.00	0.496		1.44	mg/L		94.4	(90%-110%)		09/05/17	10:47
Batch	1698269										
QC1203869011	431850001	DUP									
Phosphorus, Total as P		2.86		2.82	mg/L	1.41		(0%-27%)	KLP1	09/06/17	08:18
QC1203869010	LCS										
Phosphorus, Total as P	1.00			0.954	mg/L		95.4	(80%-124%)		09/06/17	08:16
QC1203869009	MB										
Phosphorus, Total as P			J	0.036	mg/L					09/06/17	08:15
QC1203869015	431850001	MS									
Phosphorus, Total as P	1.00	2.86		3.82	mg/L		96	(63%-139%)		09/06/17	08:19
Batch	1698270										
QC1203869021	431850001	DUP									
Nitrogen, Nitrate/Nitrite		0.134		0.134	mg/L	0 ^		(+/-0.050)	AXH3	09/05/17	10:07

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1698270										
QC1203869020	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.05	mg/L		105	(90%-110%)	AXH3	09/05/17	10:05
QC1203869019	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					09/05/17	10:03
QC1203869024	431850001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.134		1.18	mg/L		105	(90%-110%)		09/05/17	10:08
Batch	1698312										
QC1203869131	431899001	DUP									
Nitrogen, Total Kjeldahl		1.59		1.53	mg/L	3.85		(0%-20%)	KLP1	09/07/17	15:19
QC1203869130	LCS										
Nitrogen, Total Kjeldahl	1.00			1.06	mg/L		106	(90%-110%)		09/07/17	15:18
QC1203869129	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					09/07/17	15:17
QC1203869132	431899001	MS									
Nitrogen, Total Kjeldahl	1.00	1.59		2.31	mg/L		72 *	(90%-110%)		09/07/17	15:20
Solids Analysis											
Batch	1698443										
QC1203869517	432041001	DUP									
Total Dissolved Solids		129		123	mg/L	6.74*		(0%-5%)	KLP1	09/06/17	15:30
QC1203869514	LCS										
Total Dissolved Solids	300			286	mg/L		95.2	(95%-105%)		09/06/17	15:30
QC1203869513	MB										
Total Dissolved Solids			U	ND	mg/L					09/06/17	15:30

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1698841										
QC1203870473	432105009	DUP									
Alkalinity, Total as CaCO3		48.5		47.9	mg/L	1.24		(0%-20%)	RXB5	09/07/17	17:05
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203870470	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		09/07/17	15:57
QC1203870475	432105009	MS									
Alkalinity, Total as CaCO3	100	48.5		150	mg/L		102	(80%-120%)		09/07/17	17:06
Batch	1698844										
QC1203871261	432105009	DUP									
pH	H	7.76	H	7.80	SU	0.514		(0%-5%)	RXB5	09/07/17	16:55
QC1203870477	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		09/07/17	16:49
Batch	1701648										
QC1203877745	431853001	DUP									
Conductivity		267		268	umhos/cm	0.374		(0%-10%)	VH1	09/20/17	15:07
QC1203877746	432189001	DUP									
Conductivity		199		199	umhos/cm	0		(0%-10%)		09/20/17	15:12
QC1203877744	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		09/20/17	15:05

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded

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

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

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

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

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

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