

The order of this data package is as follows:

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

Comments:

Revised data begins on page 253.

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133302

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-08-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:53		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSD	
LOCATION ID:	R-58		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	1 LITER 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-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

Sampled 58' from running diesel generator. HE spot test negative

LOCATION COMMENTS:

None

FIELD PARAMETERS:

Sample Time	11:53	HH:MM	Dissolved Oxygen	5.35	Flow (in gpm)	4.35
Oxidation-Reduction Potential	068		pH	8.05	Specific Conductance	130.1
Temperature	20.2		Turbidity	0.82		

COLLECTED BY (PRINT):

K. Tow, M. Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 6/8/17 1415	RECEIVED BY (Printed Name) J. Sherwood (Signature) <i>J. Sherwood</i>	Date/Time 6/8/17 1415
---	-----------------------------	---	-----------------------------

Date/Time

Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133330

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-08-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:53		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-58		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): M. Shendo, K. Tow

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 6/8/17 1415	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 6/8/17 1415
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133340

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-08-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:53		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-58		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FB	
TOP DEPTH:	1		SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
1	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE	1	1

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): K. Tow, M. Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 6/8/15 1415	RECEIVED BY <i>Sherwood</i> (Printed Name) <i>Sherwood</i> (Signature) <i>Sherwood</i>	Date/Time 6/8/15 1415
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133345

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-08-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	11:53		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-58		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	2 MS 6/8/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): K. Tow, M. Stendo

RELINQUISHED BY (Printed Name) <i>Maryanne Stendo</i> (Signature) <i>Maryanne Stendo</i>	Date/Time 6/8/17 1415	RECEIVED BY <i>G. Sherwood</i> (Printed Name) <i>G. Sherwood</i> (Signature) <i>G. Sherwood</i>	Date/Time 6/8/17 1415
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-135753

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	0608-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:26		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-58		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE	Y	At 6CVs

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time 12:26 HH:MM Dissolved Oxygen 5.46 Flow (in gpm) 4.33
 Oxidation-Reduction Potential 113.8 pH 8.07 Specific Conductance 129.4
 Temperature 20.3 Turbidity 0.72

COLLECTED BY (PRINT):

M. Sherwood K.Tow

RELINQUISHED BY (Printed Name) <u>Maurice Sherwood</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/8/17</u> <u>1415</u>	RECEIVED BY (Printed Name) <u>M. Sherwood</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/8/17</u> <u>1415</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1716

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425329	EPA:120.1	1				
425329	EPA:150.1	1				
425329	EPA:160.1	1				
425329	EPA:170.0	3		1	1	
425329	EPA:245.2	2				
425329	EPA:300.0	1				
425329	EPA:310.1	1				
425329	EPA:335.4	1				
425329	EPA:350.1	1				
425329	EPA:351.2	1				
425329	EPA:353.2	1				
425329	EPA:365.4	1				
425329	SM:A2340B	1				
425329	SW-846:6010C	1				
425329	SW-846:6020	1				
425329	SW-846:6850	1				
425329	SW-846:8260B	1		1	1	
425329	SW-846:8270D	1			1	
425329	SW-846:8330B	2				
425329	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
425329	EPA:120.1	1679220	1679220	1										1			1				
425329	EPA:150.1	1675817	1675817	1										1			1				
425329	EPA:160.1	1673670	1673670	1					1					1			1				
425329	EPA:170.0	NA	NA	3		1	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
425329	EPA:245.2	1673861	1673859	2					1	1				1			1				
425329	EPA:300.0	1673741	1673741	1					1					1			1				
425329	EPA:310.1	1675815	1675815	1						1				1			1				
425329	EPA:335.4	1673690	1673689	1					1	1				1			1				
425329	EPA:350.1	1673875	1673874	1					1	1				1			1				
425329	EPA:351.2	1673872	1673870	1					1	1				1			1				
425329	EPA:353.2	1673698	1673698	1					1					1			1				
425329	EPA:365.4	1673877	1673876	1					1	1				1			1				
425329	SM:A2340B	1679789	1679789	1																	
425329	SW-846:6010C	1675026	1675025	1					1	1				1			1				
425329	SW-846:6020	1675028	1675027	1					1	1				1			1				
425329	SW-846:6850	1675216	1675214	1					1	1	1			1							
425329	SW-846:8260B	1676097	1676097	1		1	1		3					6							
425329	SW-846:8270D	1673585	1673582	1			1		1	1	1			1							
425329	SW-846:8330B	1673869	1673868	2					1	1	1			1							
425329	SW-846:9060	1673634	1673634	1					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	CAWA-17-133330	1203823673	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203823672	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815600	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203815599	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133308	1203810572	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203810570	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203810569	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133302	425329001	REG	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-17-133330	425329003	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133340	425329004	FB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133345	425329005	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-135753	425329006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133302	425329002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203811041	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203811040	MB	1	0	0	0
EPA:245.2	INORGANIC	WT_ESR-17-137413	1203811042	DUP	1	0	0	0
EPA:245.2	INORGANIC	WT_ESR-17-137413	1203811044	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133314	1203810743	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203810742	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203810741	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815593	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133330	1203815594	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203815591	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133280	1203810625	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133280	1203810627	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133302	425329002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203810624	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203810623	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811099	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133314	1203811100	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203811098	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203811097	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133286	1203811091	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133286	1203811092	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133302	425329002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203811090	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203811089	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203810635	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203810634	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	MD50-17-138988	1203810636	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133314	1203811108	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133314	1203811109	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133330	425329003	REG	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	LCS	1203811105	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203811104	MB	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133330	425329003	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133330	1203813736	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133330	1203813737	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133330	425329003	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203813735	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203813734	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133330	1203813741	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133330	1203813742	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133330	425329003	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203813740	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203813739	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133326	1203814196	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133326	1203814197	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133330	425329003	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203814195	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203814194	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-17-133302	425329001	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-133340	425329004	FB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-133345	425329005	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203816299	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203816300	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203817177	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203817178	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203818956	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203818957	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203816298	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203817176	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203818955	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-17-133302	425329001	REG	80	6	0	0
SW-846:8270D	SVOC	CAWA-17-133340	425329004	FB	80	6	0	0
SW-846:8270D	SVOC	LCS	1203810347	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203810346	MB	80	6	0	0
SW-846:8270D	SVOC	MD50-17-138988	1203810348	MS	0	6	76	0
SW-846:8270D	SVOC	MD50-17-138988	1203810349	MSD	0	6	76	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133302	425329002	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	1203811084	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	1203811085	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	425329006	REG	20	1	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	LCS	1203811083	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203811082	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133284	1203812104	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133302	425329002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133305	1203812105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203812103	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	LCSD	1203812277	LCSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203812102	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203811104	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0324	J	mg/L	0.050
MB	1203813734	METHOD BLANK	SW-846:6010C	W	Calcium	105	J	ug/L	200
CAWA-17-133340	425329004	FIELD BLANK	EPA:170.0	W	Temperature	5		Deg C	
CAWA-17-133345	425329005	TRIP BLANK	EPA:170.0	W	Temperature	5		Deg C	

DATA VALIDATION REPORT

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-17-133330	1203811104	METHOD BLANK	EPA.365.4	Total Phosphate as Phosphorus	0.0324	mg/L	0.0741		0.050	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAWA-17-133330	1203813737		SW-846:6010C	Silicon Dioxide	1675025	06-28-2017	W	28.2		125	75			
CAWA-17-133330	1203813737		SW-846:6010C	Silicon Dioxide	1675025	06-28-2017	W	28.2		125	75			
CAWA-17-135753	1203811084	1203811085	SW-846:8330B	Tetryl	1673868	07-07-2017	W	38	45	126	50		17	30

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

DATA VALIDATION REPORT

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-58	2017-1716	CAWA-17-133330	REG	INIT	INORGANIC	SW-846:6010C	Silicon Dioxide	J-	I6a	Y	57300	ug/L	57.3	mg/L				W	06/08/2017		1675026	VAL	Y
R-58	2017-1716	CAWA-17-133330	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	U	I4	N	0.0741	mg/L	0.0741	mg/L				W	06/08/2017		1673877	VAL	Y

Reason Code

Description

I4

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

I6a

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

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-17-133302	R-58	REG	EPA:170.0	0	1
CAWA-17-133302	R-58	REG	EPA:245.2	0	1
CAWA-17-133302	R-58	REG	EPA:335.4	0	1
CAWA-17-133302	R-58	REG	EPA:351.2	0	1
CAWA-17-133302	R-58	REG	SW-846:8260B	0	80
CAWA-17-133302	R-58	REG	SW-846:8270D	0	80
CAWA-17-133302	R-58	REG	SW-846:8330B	0	20

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133302	R-58	REG	SW-846:9060	0	1
CAWA-17-133330	R-58	REG	EPA:120.1	0	1
CAWA-17-133330	R-58	REG	EPA:150.1	0	1
CAWA-17-133330	R-58	REG	EPA:160.1	0	1
CAWA-17-133330	R-58	REG	EPA:170.0	0	1
CAWA-17-133330	R-58	REG	EPA:245.2	0	1
CAWA-17-133330	R-58	REG	EPA:300.0	0	4
CAWA-17-133330	R-58	REG	EPA:310.1	0	2
CAWA-17-133330	R-58	REG	EPA:350.1	0	1
CAWA-17-133330	R-58	REG	EPA:353.2	0	1
CAWA-17-133330	R-58	REG	EPA:365.4	0	1
CAWA-17-133330	R-58	REG	SM:A2340B	0	1
CAWA-17-133330	R-58	REG	SW-846:6010C	0	17
CAWA-17-133330	R-58	REG	SW-846:6020	0	11
CAWA-17-133330	R-58	REG	SW-846:6850	0	1
CAWA-17-133340	R-58	FB	EPA:170.0	0	1
CAWA-17-133340	R-58	FB	SW-846:8260B	0	80
CAWA-17-133340	R-58	FB	SW-846:8270D	0	80
CAWA-17-133345	R-58	FTB	EPA:170.0	0	1
CAWA-17-133345	R-58	FTB	SW-846:8260B	0	80
CAWA-17-135753	R-58	REG	EPA:170.0	0	1
CAWA-17-135753	R-58	REG	SW-846:8330B	0	20

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1716 - Rev

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
425329	SW-846:8330B	2				

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
425329	SW-846:8330B	1673869	1673868	2					1												

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133302	425329002	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-135753	425329006	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203811082	MB	3	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

<u>Reason Code</u>	<u>Description</u>
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133302	R-58	REG	SW-846:8330B	0	3
CAWA-17-135753	R-58	REG	SW-846:8330B	0	3



July 06, 2017

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

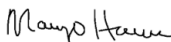
Re: LANL- WQH Water Samples
Work Order: 425329
SDG: 2017-1716

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 13, 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,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-1716
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425329
SDG: 2017-1716

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	13
Volatile Analysis.....	16
Case Narrative.....	17
Sample Data Summary.....	22
Quality Control Summary.....	32
Quality Control Data.....	50
Semi-Volatile Analysis.....	72
Case Narrative.....	73
Sample Data Summary.....	78
Quality Control Summary.....	85
Quality Control Data.....	100
Perchlorates by LCMSMS Analysis.....	113
Case Narrative.....	114
Sample Data Summary.....	120
Quality Control Summary.....	122
Quality Control Data.....	125
Explosives by LCMSMS Analysis.....	131
Case Narrative.....	132

Sample Data Summary.....	137
Quality Control Summary.....	142
Quality Control Data.....	146
Metals Analysis.....	163
Case Narrative.....	164
Sample Data Summary.....	169
Quality Control Summary.....	174
General Chem Analysis.....	188
Case Narrative.....	189
Sample Data Summary.....	220
Quality Control Summary.....	224

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425329
SDG # : 2017-1716**

July 06, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 13, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container 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>
425329001	CAWA-17-133302
425329002	CAWA-17-133302
425329003	CAWA-17-133330
425329004	CAWA-17-133340
425329005	CAWA-17-133345
425329006	CAWA-17-135753

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.

Margo Herron
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 06 July 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	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

General Engineering		COC/Lab Request #:	
Charleston	SC	2017-1716	
		Page 1 of 1	
Chain of Custody/Analysis Request		Site Name: Los Alamos National Laboratory	
Lab Agreement #:		Rad Screening Info:	
Project Number: ADEP		Lab Reporting Limit Type:	
Analysis Turnaround Time:		Sample Quantitation Limit	
24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/>			
7 Days - <input type="checkbox"/>			
14 Days - <input type="checkbox"/>			
21 Days - <input type="checkbox"/>			
28 Days - <input checked="" type="checkbox"/>			
Field Sample ID	Sample Date	Sample Time	Sample Matrix
CAWA-17-133302	Jun 8 2017	11:53	W
CAWA-17-133330	Jun 8 2017	11:53	W
CAWA-17-133340	Jun 8 2017	11:53	W
CAWA-17-133345	Jun 8 2017	11:53	W
CAWA-17-135753	Jun 8 2017	12:26	W
Special Instructions:			
Relinquished by: [Signature]			
Relinquished by: [Signature]			
Relinquished by: [Signature]			

Special Instructions:



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 125329	
Received By: ZKW		Date Received: 6/13/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1782 1970 -5c 5908 1782 1960 -6c 5908 1782 1959 -6c 5908 1782 2050 -6c 5908 1782 2040 -5c 5908 1782 2017 -6c 5908 1782 1937 -24c 5908 1782 1948 -5c 5908 1782 2061 -5c	
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/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input 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 See TEMP: 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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: Metals cont. for WST-139346 rec'd unpreserved 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: Both vials for -139346 and All vials for -139347, -348, -349, 350, and 351 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: BOD sample for -139348 rec'd out of hold
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	We rec'd a ptt container for WST-139351
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 **AM**Date **6/17/17**

Page ____ of ____

GL-CHL-SR-001 Rev 5

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12 JUN 17
ACTUAT: 52.0 LB MAN
CAD: 0014176/CAFE2916

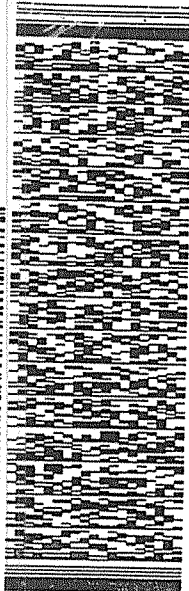
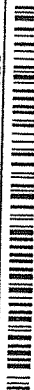
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express

TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

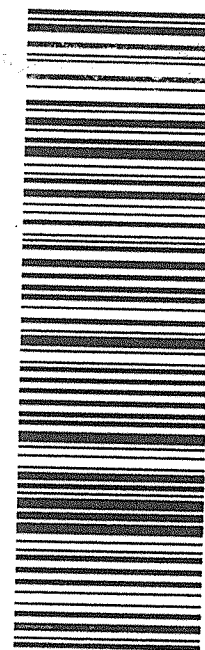
2 of 2

MPS# 5908 1782 1970

Mstr# 5908 1782 1960

X7 RBWA

29407
SC-US CHS



Part # 156149V-434 R1T2 06/15

ORIGIN ID:SAFA (505) 565-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 50.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express

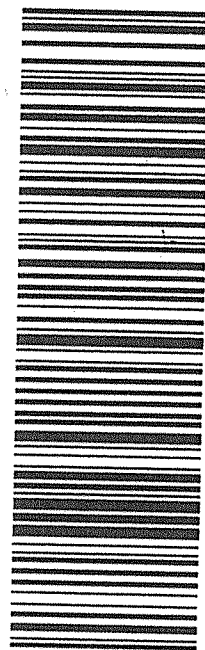


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

MPS# 5908 1782 2050
Mstr# 5908 1782 2040

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

RT 0
FZ 0

2050
06.13

ORIGIN ID:SAFA (505) 565-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWT: 59.0 LB MAN
CAD: 0014176/CAFE2916

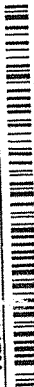
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express

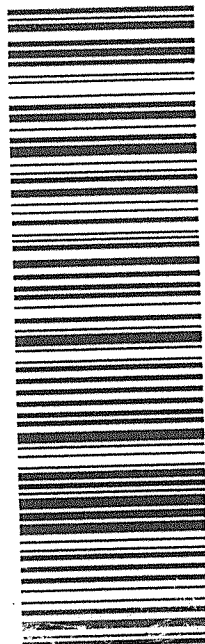


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

MPS# 5908 1782 2061
Mstr# 5908 1782 2040

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

SHIP DATE: 12 JUN 17
ACTWGT: 24.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

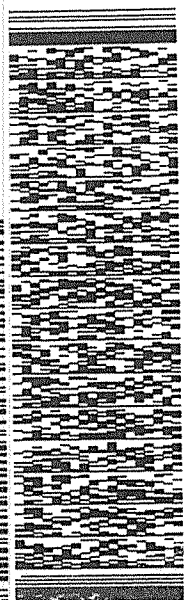
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDDASRGW04BAGWEO

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

TRK# 5908 1782 2040

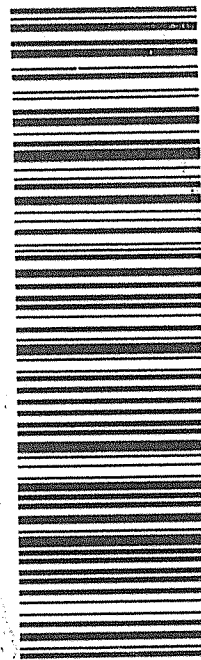
0201

MASTER

X7 RBWA

29407

SC-US CHS



Part # 156148V-434 HIT2 06/15
Part # 156148V-434 HIT2 06/15

SHIP DATE: 12 JUN 17
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

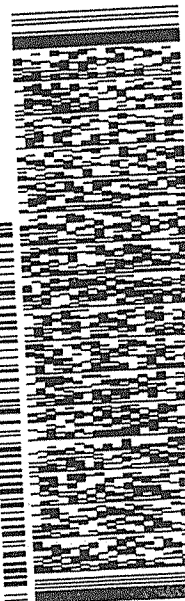
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDDASRAE20DF6X0A

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

TRK# 5908 1782 1937

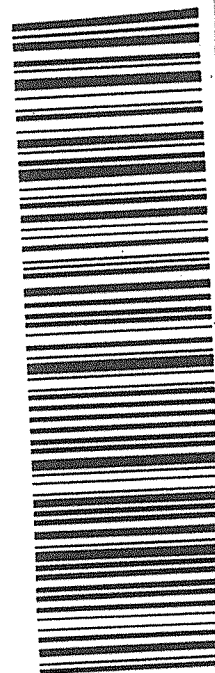
0201

MASTER

X7 RBWA

29407

SC-US CHS



Part # 156148V-434 HIT2 06/15

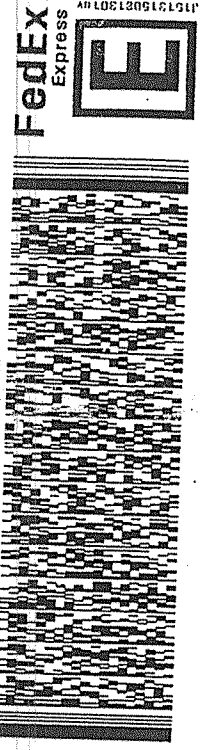
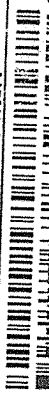
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
1A00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12 JUN 17
ACTWGT: 51.0 LB MAN
CAD: 0014178/CAFE2916
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171

REF: 21PD0ASRAE20DF6X0A



538C1/A502/329B

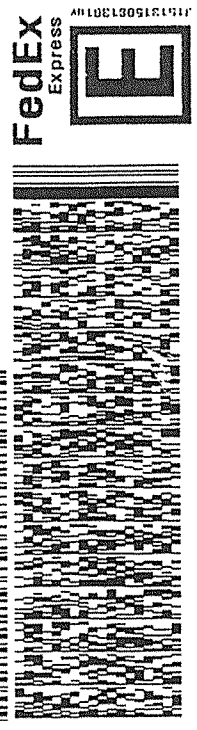
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
1A00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12 JUN 17
ACTWGT: 52.0 LB MAN
CAD: 0014178/CAFE2916
BILL SENDER

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



538C1/A502/329B

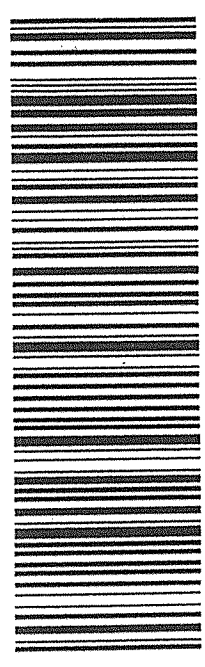
TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 2
MPS# 5908 1782 1960
Mstr# 5908 1782 1937

0201

X7 RBWA

29407
SC-US
CHS



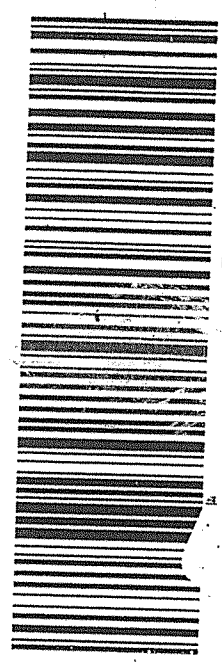
29407
SC-US
CHS

TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

3 of 3
MPS# 5908 1782 1959
Mstr# 5908 1782 1937

X7 RBWA

29407
SC-US
CHS



Part# 156148V-434 RIT2 06/15

RT0
FZ0

1959
C6.13

SHIP DATE: 12 JUN 17
ACTWGT: 53.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

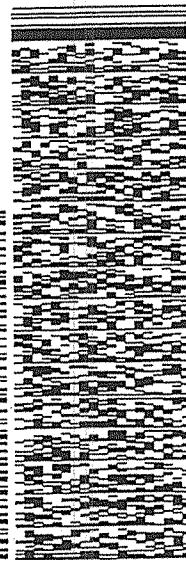
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
30 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

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

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRAE20DF6X0A

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

2 of 3

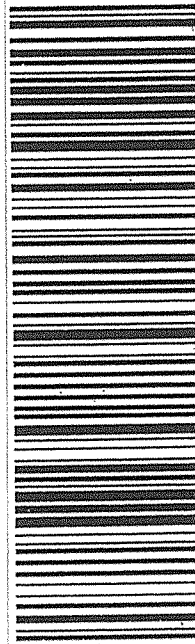
5908 1782 1948

0201

str# 5908 1782 1937

X7 RBWA

29407
SC-US CHS



1948
06.13

R70
FZ 0

SHIP DATE: 12 JUN 17
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2916

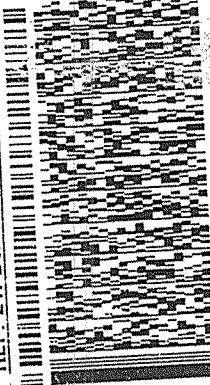
BILL SENDER

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

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

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRGW04BAGWEO

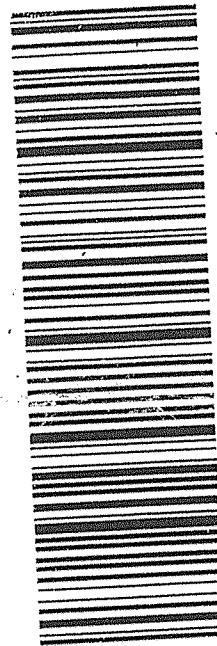


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1782 2017
0201

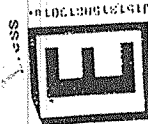
X7 RBWA

29407
SC-US CHS



Part # 156140V-434 RTT2 06/13

538C1/A502/329B
5 10:30 2017
06.13



ST F2

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 #: 2017-1716
Work Order #: 425329**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1676097

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
425329001	CAWA-17-133302
425329004	CAWA-17-133340
425329005	CAWA-17-133345
1203816298	Method Blank (MB)
1203816299	Laboratory Control Sample (LCS)
1203816300	Laboratory Control Sample (LCS)
1203816301	425329001(CAWA-17-133302) Post Spike (PS)
1203816302	425329001(CAWA-17-133302) Post Spike (PS)
1203816303	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)
1203816304	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)

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 blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 425329001 (CAWA-17-133302) 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 RPD between the matrix spike pair (See Below) were not all within the acceptance limits. However, the spike recoveries passed. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203816301PS and 1203816303PSD (CAWA-17-133302)	Chloromethane	33* (0%-20%)
	Vinyl chloride	34* (0%-20%)

Internal Standard (ISTD) Acceptance

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

Technical Information**Holding Time Specifications**

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

Electronic Package Comment

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 15:56	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 15:56		
Data File: 062117V4\4N315.D	Column: DB-624	

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 15:56	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 15:56		
Data File: 062117V4\4N315.D	Column: DB-624	

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	425329001	Date Received:	06/13/2017 09:10		
Client Sample:	VOA/SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-133302	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 15:56	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 15:56				
Data File:	062117V4\4N315.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	ug/L 96	(71%-134%)
Bromofluorobenzene	48.4	50.0	ug/L 97	(70%-131%)
Toluene-d8	48.4	50.0	ug/L 97	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	10	ug/L	0	J
	unknown siloxane	14.576	20.2	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.8	50.0	96	(71%-134%)
Bromofluorobenzene	47.1	50.0	94	(70%-131%)
Toluene-d8	48.2	50.0	96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	6.98	ug/L	0	J
	unknown siloxane	14.576	9.37	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329005

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133345

Batch ID: 1676097

Run Date: 06/21/2017 16:54

Prep Date: 06/21/2017 16:54

Data File: 062117V4\4N317.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329005

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133345

Batch ID: 1676097

Run Date: 06/21/2017 16:54

Prep Date: 06/21/2017 16:54

Data File: 062117V4\4N317.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329005

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 16:54

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 16:54

Data File: 062117V4\4N317.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	97	(71%-134%)
Bromofluorobenzene	50.5	50.0	101	(70%-131%)
Toluene-d8	48.0	50.0	96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	14.1	ug/L	0	J
	unknown siloxane	14.576	34.4	ug/L	0	J
	unknown siloxane	16.533	7.01	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1716**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203816299	LCS for batch 1676097	89	96	88
1203816300	LCS for batch 1676097	93	95	98
1203816298	MB for batch 1676097	91	98	89
425329001	CAWA-17-133302	96	97	97
425329004	CAWA-17-133340	96	96	94
425329005	CAWA-17-133345	97	96	101
1203816301	CAWA-17-133302PS	99	97	93
1203816303	CAWA-17-133302PSD	99	98	95
1203816302	CAWA-17-133302PS	97	97	101
1203816304	CAWA-17-133302PSD	102	97	101

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: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	96.3	96	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1140	91	61-125
67-64-1	LCS Acetone	250	0.0	298	119	48-157
74-88-4	LCS Iodomethane	250	0.0	244	98	72-128
75-15-0	LCS Carbon disulfide	250	0.0	234	94	69-138
108-05-4	LCS Vinyl acetate	250	0.0	213	85	67-125
78-93-3	LCS 2-Butanone	250	0.0	260	104	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	223	89	66-124
591-78-6	LCS 2-Hexanone	250	0.0	264	106	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	30.0	60	40-160
74-87-3	LCS Chloromethane	50.0	0.0	41.8	84	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	41.8	84	65-137
74-83-9	LCS Bromomethane	50.0	0.0	42.2	84	63-137
75-00-3	LCS Chloroethane	50.0	0.0	44.5	89	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	42.4	85	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	48.7	97	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	47.1	94	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	44.2	88	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	46.1	92	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	48.6	97	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	47.8	96	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	49.9	100	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	46.4	93	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	51.4	103	76-125
67-66-3	LCS Chloroform	50.0	0.0	45.4	91	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.5	93	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	45.5	91	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	49.3	99	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	45.4	91	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	48.2	96	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	46.9	94	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	47.7	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	48.4	97	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
108-88-3	LCS Toluene	50.0	0.0	44.6	89	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	46.2	92	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	44.3	89	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	47.7	95	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	45.7	91	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	47.5	95	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	46.9	94	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	45.5	91	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	46.6	93	74-126
100-42-5	LCS Styrene	50.0	0.0	51.3	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	52.8	106	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	45.2	90	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	42.4	85	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	43.7	87	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	46.3	93	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	43.7	87	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.6	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	45.9	92	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	42.5	85	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	47.7	95	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	45.9	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.5	93	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.9	96	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	45.1	90	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	44.3	89	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.5	89	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	42.6	85	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	48.0	96	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	47.1	94	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	44.6	89	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	50.9	102	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	45.6	91	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5040	101	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816300

Instrument: VOA4.I

Analysis Date: 06/21/2017 11:05

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	282	113	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	223	89	61-148
107-05-1	LCS Allyl chloride	250	0.0	237	95	59-125
107-13-1	LCS Acrylonitrile	250	0.0	222	89	65-122
107-12-0	LCS Propionitrile	250	0.0	216	86	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	229	91	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	228	91	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	218	87	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2140	86	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	36.7	73	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	99.5	100	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1350	108	56-131
67-64-1	PS Acetone	250	0.00 U	157	63	25-155
74-88-4	PS Iodomethane	250	0.00 U	264	105	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	248	99	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	211	85	48-133
78-93-3	PS 2-Butanone	250	0.00 U	204	81	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	263	105	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	228	91	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	31.9	64	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	40.3	81	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	44.3	89	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.4	87	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	44.7	89	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	43.2	86	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	50.5	101	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	50.4	101	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.7	97	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	53.8	108	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	52.6	105	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.5	107	69-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	50.3	101	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	56.3	113	71-130
67-66-3	PS Chloroform	50.0	0.00 U	50.7	101	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	50.8	102	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	49.1	98	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	52.6	105	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	52.6	105	69-130
71-43-2	PS Benzene	50.0	0.00 U	49.2	98	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	51.7	103	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	51.4	103	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	53.3	107	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	52.7	105	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	52.7	105	70-134
108-88-3	PS Toluene	50.0	0.00 U	47.1	94	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	53.7	107	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	51.1	102	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	49.5	99	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	48.7	97	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	48.7	97	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	52.6	105	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	49.4	99	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	48.1	96	61-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	49.4	99	62-131
100-42-5	PS Styrene	50.0	0.00 U	52.8	106	59-135
75-25-2	PS Bromoform	50.0	0.00 U	56.4	113	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	47.3	95	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.2	98	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	50.7	101	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.8	98	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	45.4	91	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	50.0	100	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	48.6	97	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	44.4	89	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	50.9	102	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	48.2	96	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	48.8	98	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	50.2	100	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.7	93	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	45.5	91	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	46.4	93	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.0	104	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	47.9	96	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	56.5	113	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	50.3	101	52-135

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	47.8	96	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	54.3	109	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	48.2	96	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	6270	125	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	97.6	98	59-132	2	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1370	109	56-131	1	0-20
67-64-1	PSD Acetone	250	0.00 U	153	61	25-155	3	0-20
74-88-4	PSD Iodomethane	250	0.00 U	269	108	66-133	2	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	242	97	61-141	3	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	200	80	48-133	6	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	199	80	25-143	2	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	256	102	61-127	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	214	86	33-138	6	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	32.1	64	33-164	1	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	29.0	58	53-139	33 *	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	31.4	63	58-140	34 *	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	42.1	84	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	45.1	90	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	44.2	88	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.7	101	69-127	1	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	51.5	103	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	48.9	98	62-123	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	55.2	110	69-132	3	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	52.7	105	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	53.9	108	69-127	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	52.2	104	66-137	4	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	57.0	114	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	51.4	103	71-129	1	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	52.8	106	69-139	4	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	49.9	100	67-130	2	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	55.8	112	66-143	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	52.3	105	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00 U	49.5	99	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	52.1	104	65-131	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	50.7	101	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	53.9	108	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	53.9	108	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	53.2	106	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00 U	47.7	95	60-126	1	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	54.1	108	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	51.3	103	66-125	0	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	48.2	96	67-124	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	51.4	103	60-130	5	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	51.2	102	68-143	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	54.8	110	71-127	4	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	49.6	99	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	47.6	95	61-130	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	48.2	96	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	51.5	103	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	59.4	119	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	47.3	95	55-133	0	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.6	97	62-129	1	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	50.5	101	70-124	0	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	49.3	99	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	43.7	87	50-133	4	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	47.1	94	53-135	6	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	45.6	91	56-128	6	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	44.6	89	53-130	1	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	50.6	101	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	47.5	95	53-132	2	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	47.0	94	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	48.7	97	49-138	3	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.8	94	56-126	0	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	45.8	92	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	43.7	87	43-142	6	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.5	105	62-141	1	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	47.7	95	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	55.1	110	62-134	2	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	50.7	101	52-135	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	48.5	97	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	55.2	110	71-133	2	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	48.3	97	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	6160	123	60-140	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816302

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:18

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	262	105	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	209	84	57-149
107-05-1	PS Allyl chloride	250	0.00 U	227	91	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	218	87	59-129
107-12-0	PS Propionitrile	250	0.00 U	215	86	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	222	89	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	225	90	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	216	86	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2120	85	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	37.0	74	63-146

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816304

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:47

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	280	112	49-141	7	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	231	92	57-149	10	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	244	97	54-128	7	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	236	94	59-129	8	0-20
107-12-0	PSD Propionitrile	250	0.00 U	228	91	58-131	6	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	241	96	59-134	8	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	241	96	62-135	7	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	231	92	60-136	7	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2250	90	60-143	6	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	39.6	79	63-146	7	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2017-1716	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1676097	Instrument ID:	VOA4.I	Data File:	062117V4\4N306A.D
Lab Sample ID:	1203816298	Prep Date:	06/21/2017 11:34	Analyzed:	06/21/17 11:34
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 1676097	1203816299	062117V4\4N303A.D	06/21/17	1007
02 LCS for batch 1676097	1203816300	062117V4\4N305A.D	06/21/17	1105
03 CAWA-17-133302	425329001	062117V4\4N315.D	06/21/17	1556
04 CAWA-17-133340	425329004	062117V4\4N316.D	06/21/17	1625
05 CAWA-17-133345	425329005	062117V4\4N317.D	06/21/17	1654
06 CAWA-17-133302PS	1203816301	062117V4\4N322.D	06/21/17	1920
07 CAWA-17-133302PSD	1203816303	062117V4\4N323.D	06/21/17	1949
08 CAWA-17-133302PS	1203816302	062117V4\4N324.D	06/21/17	2018
09 CAWA-17-133302PSD	1203816304	062117V4\4N325.D	06/21/17	2047

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816298		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	MB for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 11:34	Analyst:	VXY1
Prep Date:	06/21/2017 11:34	Purge Vol:	5 mL
Data File:	062117V4\4N306A.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.3	50.0	ug/L 91	(71%-134%)
Bromofluorobenzene	44.7	50.0	ug/L 89	(70%-131%)
Toluene-d8	48.9	50.0	ug/L 98	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 10:07

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		50.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		42.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		46.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		47.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		47.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		45.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		47.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		43.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.6	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		42.6	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.5	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		44.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		44.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		46.4	ug/L	0.300	1.00
78-93-3	2-Butanone		260	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		45.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		264	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		42.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		223	ug/L	1.50	5.00
67-64-1	Acetone		298	ug/L	1.50	10.0
75-05-8	Acetonitrile		1140	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		51.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		48.4	ug/L	0.300	1.00
75-25-2	Bromoform		52.8	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Matrix: WATER

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: LCS for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 10:07

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		234	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.9	ug/L	0.300	1.00
75-00-3	Chloroethane		44.5	ug/L	0.300	1.00
67-66-3	Chloroform		45.4	ug/L	0.300	1.00
74-87-3	Chloromethane		41.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		45.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		30.0	ug/L	0.300	1.00
60-29-7	Ethyl ether		48.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		45.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		244	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		44.2	ug/L	1.00	10.0
91-20-3	Naphthalene		48.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.7	ug/L	0.300	1.00
108-88-3	Toluene		44.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.2	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		42.4	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		213	ug/L	1.50	5.00
75-01-4	Vinyl chloride		41.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		96.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5040	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		46.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816299		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	LCS for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 10:07	Analyst:	VXY1
Prep Date:	06/21/2017 10:07		
Data File:	062117V4\4N303A.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		46.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.7	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	44.2	50.0	ug/L 88	(70%-131%)
Toluene-d8	48.2	50.0	ug/L 96	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:05

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		36.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		282	ug/L	1.50	5.00
107-13-1	Acrylonitrile		222	ug/L	1.50	5.00
107-05-1	Allyl chloride		237	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Matrix: WATER

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: LCS for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 11:05

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		218	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2140	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		229	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		228	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		216	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		223	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816300		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	LCS for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 11:05	Analyst:	VXY1
Prep Date:	06/21/2017 11:05		
Data File:	062117V4\4N305A.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.4	50.0	93	(71%-134%)
Bromofluorobenzene	48.9	50.0	98	(70%-131%)
Toluene-d8	47.7	50.0	95	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816301	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:20	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:20				
Data File:	062117V4\4N322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		50.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		47.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.6	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.7	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		50.3	ug/L	0.300	1.00
78-93-3	2-Butanone		204	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		48.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		228	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		263	ug/L	1.50	5.00
67-64-1	Acetone		157	ug/L	1.50	10.0
75-05-8	Acetonitrile		1350	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		56.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.7	ug/L	0.300	1.00
75-25-2	Bromoform		56.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816301	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:20		
Data File: 062117V4\4N322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		248	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.4	ug/L	0.300	1.00
75-00-3	Chloroethane		44.7	ug/L	0.300	1.00
67-66-3	Chloroform		50.7	ug/L	0.300	1.00
74-87-3	Chloromethane		40.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		48.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		31.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.9	ug/L	0.300	1.00
74-88-4	Iodomethane		264	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.7	ug/L	1.00	10.0
91-20-3	Naphthalene		56.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		52.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.7	ug/L	0.300	1.00
108-88-3	Toluene		47.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		43.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		211	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.5	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		52.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		99.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6270	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.4	ug/L	0.300	1.00
95-47-6	o-Xylene		49.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.8	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816301	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:20	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:20				
Data File:	062117V4\4N322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.3	50.0	99	(71%-134%)
Bromofluorobenzene	46.7	50.0	93	(70%-131%)
Toluene-d8	48.4	50.0	97	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		262	ug/L	1.50	5.00
107-13-1	Acrylonitrile		218	ug/L	1.50	5.00
107-05-1	Allyl chloride		227	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		216	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2120	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	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	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		215	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		209	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.7	50.0	97	(71%-134%)
Bromofluorobenzene	50.4	50.0	101	(70%-131%)
Toluene-d8	48.5	50.0	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816303	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:49	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:49				
Data File:	062117V4\4N323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		55.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		51.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		48.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		47.1	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		48.2	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.2	ug/L	0.300	1.00
78-93-3	2-Butanone		199	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		45.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		214	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		256	ug/L	1.50	5.00
67-64-1	Acetone		153	ug/L	1.50	10.0
75-05-8	Acetonitrile		1370	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		57.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.9	ug/L	0.300	1.00
75-25-2	Bromoform		59.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816303	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:49	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:49		
Data File: 062117V4\4N323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		242	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.6	ug/L	0.300	1.00
75-00-3	Chloroethane		45.1	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		29.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		51.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		32.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.7	ug/L	0.300	1.00
74-88-4	Iodomethane		269	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.9	ug/L	1.00	10.0
91-20-3	Naphthalene		55.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.4	ug/L	0.300	1.00
108-88-3	Toluene		47.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		44.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		200	ug/L	1.50	5.00
75-01-4	Vinyl chloride		31.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		97.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6160	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		48.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.0	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816303	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:49	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:49				
Data File:	062117V4\4N323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		55.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.6	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		54.1	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.5	50.0	99	(71%-134%)
Bromofluorobenzene	47.6	50.0	95	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816304	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:47	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:47				
Data File:	062117V4\4N325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		39.6	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		280	ug/L	1.50	5.00
107-13-1	Acrylonitrile		236	ug/L	1.50	5.00
107-05-1	Allyl chloride		244	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816304	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:47	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:47		
Data File: 062117V4\4N325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		231	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2250	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		241	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		241	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		228	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		231	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816304	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:47	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:47				
Data File:	062117V4\4N325.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L 101	(70%-131%)
Toluene-d8	48.7	50.0	ug/L 97	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

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:	1673585
Prep Batch Number:	1673582

Sample Analysis

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

Sample ID	Client ID
425329001	CAWA-17-133302
425329004	CAWA-17-133340
1203810346	Method Blank (MB)
1203810347	Laboratory Control Sample (LCS)
1203810348	425316004(MD50-17-138988) Matrix Spike (MS)
1203810349	425316004(MD50-17-138988) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 39.

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

Calibration Information

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

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

Initial Calibration

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

CCV Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 425316004 (MD50-17-138988) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

The 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**

Sample 1203810347 (LCS) required manual integration in order to properly identify one or more peaks and/or to correctly position the baseline as set in the calibration standard injections.

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 425329001 (CAWA-17-133302) and 425329004 (CAWA-17-133340) 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
MSD1.I	Agilent 6890N/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Polysilarylene-95% Polydimethylsiloxane)

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

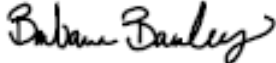
The Qualifiers in this report are defined as follows:

- * 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: 10 JUL 2017

Title: Data Validator

Sample Data Summary

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

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 14:19	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 950 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1413.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.5	ug/L	3.16	10.5
120-82-1	1,2,4-Trichlorobenzene	U	10.5	ug/L	3.16	10.5
95-50-1	1,2-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
122-66-7	Azobenzene	U	10.5	ug/L	3.16	10.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
106-46-7	1,4-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
123-91-1	1,4-Dioxane	U	10.5	ug/L	3.16	10.5
90-12-0	1-Methylnaphthalene	U	1.05	ug/L	0.316	1.05
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.5	ug/L	3.16	10.5
95-95-4	2,4,5-Trichlorophenol	U	10.5	ug/L	3.16	10.5
88-06-2	2,4,6-Trichlorophenol	U	10.5	ug/L	3.16	10.5
120-83-2	2,4-Dichlorophenol	U	10.5	ug/L	3.16	10.5
105-67-9	2,4-Dimethylphenol	U	10.5	ug/L	3.16	10.5
51-28-5	2,4-Dinitrophenol	U	21.1	ug/L	5.26	21.1
121-14-2	2,4-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
606-20-2	2,6-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
91-58-7	2-Chloronaphthalene	U	1.05	ug/L	0.432	1.05
95-57-8	2-Chlorophenol	U	10.5	ug/L	3.16	10.5
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.5	ug/L	3.16	10.5
91-57-6	2-Methylnaphthalene	U	1.05	ug/L	0.316	1.05
88-75-5	2-Nitrophenol	U	10.5	ug/L	3.16	10.5
91-94-1	3,3'-Dichlorobenzidine	U	10.5	ug/L	3.16	10.5
101-55-3	4-Bromophenylphenylether	U	10.5	ug/L	3.16	10.5
59-50-7	Parachlorometa cresol	U	10.5	ug/L	3.16	10.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.5	ug/L	3.47	10.5
7005-72-3	4-Chlorophenylphenylether	U	10.5	ug/L	3.16	10.5
100-02-7	4-Nitrophenol	U	10.5	ug/L	3.16	10.5
83-32-9	Acenaphthene	U	1.05	ug/L	0.316	1.05
208-96-8	Acenaphthylene	U	1.05	ug/L	0.316	1.05
62-53-3	Aniline	U	10.5	ug/L	4.42	10.5
120-12-7	Anthracene	U	1.05	ug/L	0.316	1.05
1912-24-9	Atrazine	U	10.5	ug/L	3.16	10.5
92-87-5	Benzidine	U	10.5	ug/L	4.11	10.5
56-55-3	Benzo(a)anthracene	U	1.05	ug/L	0.316	1.05
50-32-8	Benzo(a)pyrene	U	1.05	ug/L	0.316	1.05
205-99-2	Benzo(b)fluoranthene	U	1.05	ug/L	0.316	1.05
191-24-2	Benzo(ghi)perylene	U	1.05	ug/L	0.316	1.05

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

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 14:19	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 950 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1413.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.05	ug/L	0.316	1.05
65-85-0	Benzoic acid	U	21.1	ug/L	6.32	21.1
100-51-6	Benzyl alcohol	U	10.5	ug/L	3.16	10.5
85-68-7	Butylbenzylphthalate	U	10.5	ug/L	3.16	10.5
218-01-9	Chrysene	U	1.05	ug/L	0.316	1.05
84-74-2	Di-n-butylphthalate	U	10.5	ug/L	3.16	10.5
117-84-0	Di-n-octylphthalate	U	10.5	ug/L	3.16	10.5
53-70-3	Dibenzo(a,h)anthracene	U	1.05	ug/L	0.316	1.05
132-64-9	Dibenzofuran	U	10.5	ug/L	3.16	10.5
84-66-2	Diethylphthalate	U	10.5	ug/L	3.16	10.5
131-11-3	Dimethylphthalate	U	10.5	ug/L	3.16	10.5
88-85-7	Dinoseb	U	10.5	ug/L	3.16	10.5
122-39-4	Diphenylamine	U	10.5	ug/L	3.16	10.5
206-44-0	Fluoranthene	U	1.05	ug/L	0.316	1.05
86-73-7	Fluorene	U	1.05	ug/L	0.316	1.05
118-74-1	Hexachlorobenzene	U	10.5	ug/L	3.16	10.5
87-68-3	Hexachlorobutadiene	U	10.5	ug/L	3.16	10.5
77-47-4	Hexachlorocyclopentadiene	U	10.5	ug/L	3.16	10.5
67-72-1	Hexachloroethane	U	10.5	ug/L	3.16	10.5
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.05	ug/L	0.316	1.05
78-59-1	Isophorone	U	10.5	ug/L	3.68	10.5
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.5	ug/L	3.16	10.5
924-16-3	N-Nitrosodi-n-butylamine	U	10.5	ug/L	3.16	10.5
55-18-5	N-Nitrosodiethylamine	U	10.5	ug/L	3.16	10.5
621-64-7	N-Nitrosodi--n-propylamine	U	10.5	ug/L	3.16	10.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.5	ug/L	3.16	10.5
91-20-3	Naphthalene	U	1.05	ug/L	0.316	1.05
98-95-3	Nitrobenzene	U	10.5	ug/L	3.16	10.5
608-93-5	Pentachlorobenzene	U	10.5	ug/L	3.16	10.5
87-86-5	Pentachlorophenol	U	10.5	ug/L	3.16	10.5
85-01-8	Phenanthrene	U	1.05	ug/L	0.316	1.05
108-95-2	Phenol	U	10.5	ug/L	3.16	10.5
129-00-0	Pyrene	U	1.05	ug/L	0.316	1.05
110-86-1	Pyridine	U	10.5	ug/L	3.16	10.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.5	ug/L	3.16	10.5
111-91-1	bis(2-Chloroethoxy)methane	U	10.5	ug/L	3.16	10.5
111-44-4	bis(2-Chloroethyl) ether	U	10.5	ug/L	3.16	10.5
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.5	ug/L	3.16	10.5

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

Page 3 of 3

SDG Number: 2017-1716
Lab Sample ID: 425329001
Client Sample: VOA/SVOA
Client ID: CAWA-17-133302
Batch ID: 1673585
Run Date: 06/14/2017 14:19
Prep Date: 06/13/2017 17:55
Data File: s061417.B\s1f1413.D

Date Collected: 06/08/2017 11:53
Date Received: 06/13/2017 09:10
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JMB3
Aliquot: 950 mL
Column: 25x.20x.33

Matrix: W
Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	10.5	ug/L	3.89	10.5
99-09-2	3-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.5	ug/L	3.16	10.5
88-74-4	2-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.2	105	ug/L	57 (32%-124%)
2-Fluorobiphenyl	30.6	52.6	ug/L	58 (32%-112%)
2-Fluorophenol	35.3	105	ug/L	33 (15%-88%)
Nitrobenzene-d5	28.2	52.6	ug/L	54 (36%-115%)
Phenol-d5	21.2	105	ug/L	20 (15%-91%)
p-Terphenyl-d14	39.8	52.6	ug/L	76 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	17.396	7.53	ug/L	0	J

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

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1673585

Inst: MSD1.I

Dilution: 1

Run Date: 06/14/2017 14:50

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1414.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.2	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	10.2	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
122-66-7	Azobenzene	U	10.2	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	U	10.2	ug/L	3.06	10.2
90-12-0	1-Methylnaphthalene	U	1.02	ug/L	0.306	1.02
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.2	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	10.2	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	10.2	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	10.2	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	10.2	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	20.4	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	1.02	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	10.2	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.2	ug/L	3.06	10.2
91-57-6	2-Methylnaphthalene	U	1.02	ug/L	0.306	1.02
88-75-5	2-Nitrophenol	U	10.2	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	10.2	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	10.2	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	10.2	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.2	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	10.2	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	10.2	ug/L	3.06	10.2
83-32-9	Acenaphthene	U	1.02	ug/L	0.306	1.02
208-96-8	Acenaphthylene	U	1.02	ug/L	0.306	1.02
62-53-3	Aniline	U	10.2	ug/L	4.29	10.2
120-12-7	Anthracene	U	1.02	ug/L	0.306	1.02
1912-24-9	Atrazine	U	10.2	ug/L	3.06	10.2
92-87-5	Benzidine	U	10.2	ug/L	3.98	10.2
56-55-3	Benzo(a)anthracene	U	1.02	ug/L	0.306	1.02
50-32-8	Benzo(a)pyrene	U	1.02	ug/L	0.306	1.02
205-99-2	Benzo(b)fluoranthene	U	1.02	ug/L	0.306	1.02
191-24-2	Benzo(ghi)perylene	U	1.02	ug/L	0.306	1.02

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

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD1.I

Dilution: 1

Batch ID: 1673585

Run Date: 06/14/2017 14:50

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1414.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.02	ug/L	0.306	1.02
65-85-0	Benzoic acid	U	20.4	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	10.2	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	10.2	ug/L	3.06	10.2
218-01-9	Chrysene	U	1.02	ug/L	0.306	1.02
84-74-2	Di-n-butylphthalate	U	10.2	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	10.2	ug/L	3.06	10.2
53-70-3	Dibenzo(a,h)anthracene	U	1.02	ug/L	0.306	1.02
132-64-9	Dibenzofuran	U	10.2	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	10.2	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	10.2	ug/L	3.06	10.2
88-85-7	Dinoseb	U	10.2	ug/L	3.06	10.2
122-39-4	Diphenylamine	U	10.2	ug/L	3.06	10.2
206-44-0	Fluoranthene	U	1.02	ug/L	0.306	1.02
86-73-7	Fluorene	U	1.02	ug/L	0.306	1.02
118-74-1	Hexachlorobenzene	U	10.2	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	10.2	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	10.2	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	10.2	ug/L	3.06	10.2
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.02	ug/L	0.306	1.02
78-59-1	Isophorone	U	10.2	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.2	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	10.2	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	10.2	ug/L	3.06	10.2
621-64-7	N-Nitrosodi--n-propylamine	U	10.2	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.2	ug/L	3.06	10.2
91-20-3	Naphthalene	U	1.02	ug/L	0.306	1.02
98-95-3	Nitrobenzene	U	10.2	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	10.2	ug/L	3.06	10.2
87-86-5	Pentachlorophenol	U	10.2	ug/L	3.06	10.2
85-01-8	Phenanthrene	U	1.02	ug/L	0.306	1.02
108-95-2	Phenol	U	10.2	ug/L	3.06	10.2
129-00-0	Pyrene	U	1.02	ug/L	0.306	1.02
110-86-1	Pyridine	U	10.2	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.2	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	10.2	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	10.2	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.2	ug/L	3.06	10.2

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

Page 3 of 3

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1673585

Run Date: 06/14/2017 14:50

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1414.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 980 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	10.2	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.2	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	61.6	102	ug/L	60	(32%-124%)
2-Fluorobiphenyl	30.1	51.0	ug/L	59	(32%-112%)
2-Fluorophenol	35.2	102	ug/L	34	(15%-88%)
Nitrobenzene-d5	27.6	51.0	ug/L	54	(36%-115%)
Phenol-d5	21.1	102	ug/L	21	(15%-91%)
p-Terphenyl-d14	38.3	51.0	ug/L	75	(36%-121%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1716

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203810346	MB for batch 1673582	34	21	68	74	60	87
1203810347	LCS for batch 1673582	44	25	79	79	81	88
1203810348	MD50-17-138988MS	48	35	62	63	70	77
1203810349	MD50-17-138988MSD	47	35	59	61	74	76
425329001	CAWA-17-133302	33	20	54	58	57	76
425329004	CAWA-17-133340	34	21	54	59	60	75

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: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	21.5	43	30-88
110-86-1	LCS Pyridine	50.0	0.0	22.1	44	27-89
62-53-3	LCS Aniline	50.0	0.0	38.5	77	49-112
108-95-2	LCS Phenol	50.0	0.0	13.8	28	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	35.4	71	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	35.6	71	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	31.2	62	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	30.9	62	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	31.9	64	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	38.9	78	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	30.8	62	44-102
95-48-7	LCS o-Cresol	50.0	0.0	30.7	61	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	29.4	59	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	34.7	69	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	31.0	62	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	38.7	77	53-115
78-59-1	LCS Isophorone	50.0	0.0	39.2	78	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	38.7	77	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	35.2	70	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	38.2	76	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.4	81	53-109
65-85-0	LCS Benzoic acid	100	0.0	23.8	24	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	48.7	97	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	34.5	69	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	41.8	84	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	36.7	73	42-103
91-20-3	LCS Naphthalene	50.0	0.0	35.9	72	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	36.4	73	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	19.8	40	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	41.2	82	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	38.4	77	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	33.7	67	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	39.8	80	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.4	95	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	44.7	89	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	44.1	88	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	43.9	88	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	38.7	77	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	41.1	82	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	34.6	69	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	39.3	79	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	41.7	83	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	45.1	90	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	13.3	27	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	42.0	84	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	43.5	87	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	40.2	80	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	38.3	77	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	37.7	75	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	38.2	76	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	41.7	83	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	41.9	84	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	32.9	66	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.8	80	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.4	79	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	42.0	84	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	40.0	80	54-118
129-00-0	LCS Pyrene	50.0	0.0	42.9	86	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	45.5	91	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	45.6	91	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	44.7	89	57-112
218-01-9	LCS Chrysene	50.0	0.0	43.9	88	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	45.3	91	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	44.7	89	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	43.8	88	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	44.4	89	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	46.4	93	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	45.9	92	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	43.8	88	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	24.9	50	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	36.2	72	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	37.8	76	44-102
1912-24-9	LCS Atrazine	50.0	0.0	47.8	96	60-131
92-87-5	LCS Benzidine	100	0.0	51.7	52	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	43.7	87	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	34.5	69	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	106	0.00 U	50.8	48	25-106
110-86-1	MS Pyridine	106	0.00 U	51.3	48	24-93
62-53-3	MS Aniline	106	0.00 U	67.9	64	37-113
108-95-2	MS Phenol	106	0.00 U	39.6	37	23-82
111-44-4	MS bis(2-Chloroethyl) ether	106	0.00 U	58.1	55	39-114
95-57-8	MS 2-Chlorophenol	106	0.00 U	62.2	58	37-108
541-73-1	MS 1,3-Dichlorobenzene	106	0.00 U	52.4	49	27-97
106-46-7	MS 1,4-Dichlorobenzene	106	0.00 U	52.9	50	28-97
95-50-1	MS 1,2-Dichlorobenzene	106	0.00 U	55.1	52	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	106	0.00 U	66.4	62	32-127
100-51-6	MS Benzyl alcohol	106	0.00 U	60.1	57	37-116
95-48-7	MS o-Cresol	106	0.00 U	61.3	58	34-109
65794-96-9	MS m,p-Cresols	106	0.00 U	61.8	58	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	106	0.00 U	61.0	57	42-118
67-72-1	MS Hexachloroethane	106	0.00 U	51.4	48	29-94
98-95-3	MS Nitrobenzene	106	0.00 U	64.9	61	38-123
78-59-1	MS Isophorone	106	0.00 U	66.9	63	43-120
88-75-5	MS 2-Nitrophenol	106	0.00 U	69.1	65	39-115
105-67-9	MS 2,4-Dimethylphenol	106	0.00 U	63.0	59	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	106	0.00 U	64.2	60	42-118
120-83-2	MS 2,4-Dichlorophenol	106	0.00 U	71.0	67	40-111
65-85-0	MS Benzoic acid	213	0.00 U	119	56	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	106	0.00	U	84.4	79	44-138
87-68-3	MS	Hexachlorobutadiene	106	0.00	U	57.6	54	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00	U	76.8	72	41-122
91-57-6	MS	2-Methylnaphthalene	106	0.00	U	63.3	59	29-109
91-20-3	MS	Naphthalene	106	0.00	U	61.1	57	31-108
90-12-0	MS	1-Methylnaphthalene	106	0.00	U	64.2	60	33-112
77-47-4	MS	Hexachlorocyclopentadiene	106	0.00	U	33.6	32	26-79
88-06-2	MS	2,4,6-Trichlorophenol	106	0.00	U	73.2	69	39-124
95-95-4	MS	2,4,5-Trichlorophenol	106	0.00	U	68.0	64	42-120
91-58-7	MS	2-Chloronaphthalene	106	0.00	U	58.3	55	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	106	0.00	U	72.4	68	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	106	0.00	U	89.4	84	42-144
131-11-3	MS	Dimethylphthalate	106	0.00	U	80.4	76	45-128
606-20-2	MS	2,6-Dinitrotoluene	106	0.00	U	77.9	73	46-124
121-14-2	MS	2,4-Dinitrotoluene	106	0.00	U	80.4	76	45-125
208-96-8	MS	Acenaphthylene	106	0.00	U	68.0	64	35-120
83-32-9	MS	Acenaphthene	106	0.00	U	71.6	67	35-117
51-28-5	MS	2,4-Dinitrophenol	106	0.00	U	86.2	81	27-122
132-64-9	MS	Dibenzofuran	106	0.00	U	68.5	64	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	106	0.00	U	77.1	72	40-128
84-66-2	MS	Diethylphthalate	106	0.00	U	81.4	76	43-127
100-02-7	MS	4-Nitrophenol	106	0.00	U	42.9	40	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	106	0.00	U	73.7	69	39-117
7005-72-3	MS	4-Chlorophenylphenylether	106	0.00	U	76.4	72	39-121
100-01-6	MS	4-Nitroaniline <i>p</i> -Nitroaniline	106	0.00	U	81.1	76	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	106	0.00	U	88.5	83	32-126
122-39-4	MS	Diphenylamine	106	0.00	U	68.0	64	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	106	0.00	U	68.2	64	38-120
101-55-3	MS	4-Bromophenylphenylether	106	0.00	U	74.7	70	39-121
118-74-1	MS	Hexachlorobenzene	106	0.00	U	75.7	71	40-118
87-86-5	MS	Pentachlorophenol	106	0.00	U	79.2	74	35-121
85-01-8	MS	Phenanthrene	106	0.00	U	73.6	69	40-115
120-12-7	MS	Anthracene	106	0.00	U	75.0	71	38-120
84-74-2	MS	Di-n-butylphthalate	106	0.00	U	81.8	77	41-128
206-44-0	MS	Fluoranthene	106	0.00	U	79.6	75	41-119
129-00-0	MS	Pyrene	106	0.00	U	79.0	74	35-128
85-68-7	MS	Butylbenzylphthalate	106	0.00	U	86.7	81	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	106	0.00	U	90.8	85	38-131
56-55-3	MS	Benzo(a)anthracene	106	0.00	U	86.1	81	39-120
218-01-9	MS	Chrysene	106	0.00	U	84.0	79	41-124
117-84-0	MS	Di-n-octylphthalate	106	0.00	U	88.4	83	37-134
205-99-2	MS	Benzo(b)fluoranthene	106	0.00	U	89.7	84	31-122
207-08-9	MS	Benzo(k)fluoranthene	106	0.00	U	85.7	81	33-123
50-32-8	MS	Benzo(a)pyrene	106	0.00	U	86.6	81	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	106	0.00 U	85.7	81	27-121
53-70-3	MS Dibenzo(a,h)anthracene	106	0.00 U	85.8	81	30-125
191-24-2	MS Benzo(ghi)perylene	106	0.00 U	81.9	77	24-126
123-91-1	MS 1,4-Dioxane	106	0.00 U	56.5	53	24-110
930-55-2	MS N-Nitrosopyrrolidine	106	0.00 U	66.9	63	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	106	0.00 U	65.6	62	32-101
1912-24-9	MS Atrazine	106	0.00 U	82.6	78	42-129
92-87-5	MS Benzidine	213	0.00 U	75.1	35	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	106	0.00 U	76.4	72	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	106	0.00 U	59.2	56	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	106	0.00 U	47.5	45	25-106	7	0-30
110-86-1	MSD Pyridine	106	0.00 U	50.5	48	24-93	1	0-30
62-53-3	MSD Aniline	106	0.00 U	67.8	64	37-113	0	0-30
108-95-2	MSD Phenol	106	0.00 U	38.4	36	23-82	3	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	106	0.00 U	56.0	53	39-114	4	0-30
95-57-8	MSD 2-Chlorophenol	106	0.00 U	59.5	56	37-108	4	0-30
541-73-1	MSD 1,3-Dichlorobenzene	106	0.00 U	49.9	47	27-97	5	0-30
106-46-7	MSD 1,4-Dichlorobenzene	106	0.00 U	50.1	47	28-97	6	0-30
95-50-1	MSD 1,2-Dichlorobenzene	106	0.00 U	52.8	50	28-99	4	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	106	0.00 U	62.7	59	32-127	6	0-30
100-51-6	MSD Benzyl alcohol	106	0.00 U	58.9	55	37-116	2	0-30
95-48-7	MSD o-Cresol	106	0.00 U	58.3	55	34-109	5	0-30
65794-96-9	MSD m,p-Cresols	106	0.00 U	61.8	58	36-120	0	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	106	0.00 U	56.5	53	42-118	8	0-30
67-72-1	MSD Hexachloroethane	106	0.00 U	50.3	47	29-94	2	0-30
98-95-3	MSD Nitrobenzene	106	0.00 U	61.1	57	38-123	6	0-30
78-59-1	MSD Isophorone	106	0.00 U	63.8	60	43-120	5	0-30
88-75-5	MSD 2-Nitrophenol	106	0.00 U	64.1	60	39-115	7	0-30
105-67-9	MSD 2,4-Dimethylphenol	106	0.00 U	60.7	57	39-107	4	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	106	0.00 U	61.3	58	42-118	5	0-30
120-83-2	MSD 2,4-Dichlorophenol	106	0.00 U	66.7	63	40-111	6	0-30
65-85-0	MSD Benzoic acid	213	0.00 U	119	56	17-95	0	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	106	0.00 U	82.9	78	44-138	2	0-30
87-68-3	MSD Hexachlorobutadiene	106	0.00 U	56.0	53	26-98	3	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00 U	75.5	71	41-122	2	0-30
91-57-6	MSD 2-Methylnaphthalene	106	0.00 U	59.3	56	29-109	6	0-30
91-20-3	MSD Naphthalene	106	0.00 U	57.0	54	31-108	7	0-30
90-12-0	MSD 1-Methylnaphthalene	106	0.00 U	59.8	56	33-112	7	0-30
77-47-4	MSD Hexachlorocyclopentadiene	106	0.00 U	30.4	29	26-79	10	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	106	0.00 U	72.8	68	39-124	1	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	106	0.00 U	65.1	61	42-120	4	0-30
91-58-7	MSD 2-Chloronaphthalene	106	0.00 U	54.9	52	29-113	6	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	106	0.00 U	74.4	70	41-121	3	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	106	0.00 U	90.6	85	42-144	1	0-30
131-11-3	MSD Dimethylphthalate	106	0.00 U	83.5	79	45-128	4	0-30
606-20-2	MSD 2,6-Dinitrotoluene	106	0.00 U	81.3	76	46-124	4	0-30
121-14-2	MSD 2,4-Dinitrotoluene	106	0.00 U	85.7	81	45-125	6	0-30
208-96-8	MSD Acenaphthylene	106	0.00 U	66.9	63	35-120	2	0-30
83-32-9	MSD Acenaphthene	106	0.00 U	69.2	65	35-117	3	0-30
51-28-5	MSD 2,4-Dinitrophenol	106	0.00 U	87.3	82	27-122	1	0-30
132-64-9	MSD Dibenzofuran	106	0.00 U	67.8	64	38-113	1	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	106	0.00 U	78.6	74	40-128	2	0-30
84-66-2	MSD Diethylphthalate	106	0.00 U	85.3	80	43-127	5	0-30
100-02-7	MSD 4-Nitrophenol	106	0.00 U	45.3	43	17-85	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	106	0.00 U	75.8	71	39-117	3	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	106	0.00 U	77.1	72	39-121	1	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	106	0.00 U	87.4	82	30-133	7	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	106	0.00 U	91.6	86	32-126	4	0-30
122-39-4	MSD Diphenylamine	106	0.00 U	73.1	69	37-118	7	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	106	0.00 U	72.2	68	38-120	6	0-30
101-55-3	MSD 4-Bromophenylphenylether	106	0.00 U	78.8	74	39-121	5	0-30
118-74-1	MSD Hexachlorobenzene	106	0.00 U	81.6	77	40-118	7	0-30
87-86-5	MSD Pentachlorophenol	106	0.00 U	81.6	77	35-121	3	0-30
85-01-8	MSD Phenanthrene	106	0.00 U	79.7	75	40-115	8	0-30
120-12-7	MSD Anthracene	106	0.00 U	79.2	74	38-120	5	0-30
84-74-2	MSD Di-n-butylphthalate	106	0.00 U	87.1	82	41-128	6	0-30
206-44-0	MSD Fluoranthene	106	0.00 U	84.6	79	41-119	6	0-30
129-00-0	MSD Pyrene	106	0.00 U	76.8	72	35-128	3	0-30
85-68-7	MSD Butylbenzylphthalate	106	0.00 U	87.0	82	40-129	0	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	106	0.00 U	92.9	87	38-131	2	0-30
56-55-3	MSD Benzo(a)anthracene	106	0.00 U	87.8	83	39-120	2	0-30
218-01-9	MSD Chrysene	106	0.00 U	88.3	83	41-124	5	0-30
117-84-0	MSD Di-n-octylphthalate	106	0.00 U	94.8	89	37-134	7	0-30
205-99-2	MSD Benzo(b)fluoranthene	106	0.00 U	89.4	84	31-122	0	0-30
207-08-9	MSD Benzo(k)fluoranthene	106	0.00 U	85.4	80	33-123	0	0-30
50-32-8	MSD Benzo(a)pyrene	106	0.00 U	90.8	85	32-118	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	106	0.00 U	98.2	92	27-121	14	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	106	0.00 U	95.1	89	30-125	10	0-30
191-24-2	MSD Benzo(ghi)perylene	106	0.00 U	90.8	85	24-126	10	0-30
123-91-1	MSD 1,4-Dioxane	106	0.00 U	53.3	50	24-110	6	0-30
930-55-2	MSD N-Nitrosopyrrolidine	106	0.00 U	68.0	64	47-119	2	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	106	0.00 U	61.7	58	32-101	6	0-30
1912-24-9	MSD Atrazine	106	0.00 U	89.7	84	42-129	8	0-30
92-87-5	MSD Benzidine	213	0.00 U	98.8	46	15-130	27	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	106	0.00 U	90.0	85	34-124	16	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	106	0.00 U	54.5	51	26-102	8	0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2017-1716	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1673582	Instrument ID:	MSD1.I	Data File:	s061417.B\s1f1408.D
Lab Sample ID:	1203810346	Prep Date:	06/13/2017 17:55	Analyzed:	06/14/17 11:47
Column:	25x.20x.33				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1673582	1203810347	s061417.B\s1f1409.D	06/14/17	1217
02 MD50-17-138988MS	1203810348	s061417.B\s1f1411.D	06/14/17	1318
03 MD50-17-138988MSD	1203810349	s061417.B\s1f1412.D	06/14/17	1349
04 CAWA-17-133302	425329001	s061417.B\s1f1413.D	06/14/17	1419
05 CAWA-17-133340	425329004	s061417.B\s1f1414.D	06/14/17	1450

Quality Control Data

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

SDG Number: 2017-1716

Lab Sample ID: 1203810346

Client Sample: QC for batch 1673582

Client ID: MB for batch 1673582

Batch ID: 1673585

Run Date: 06/14/2017 11:47

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1408.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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

Page 2 of 3

SDG Number: 2017-1716

Lab Sample ID: 1203810346

Client Sample: QC for batch 1673582

Client ID: MB for batch 1673582

Batch ID: 1673585

Run Date: 06/14/2017 11:47

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1408.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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

Page 3 of 3

SDG Number: 2017-1716	Matrix: WATER
Lab Sample ID: 1203810346	
Client Sample: QC for batch 1673582	Client: ARSL004
Client ID: MB for batch 1673582	Method: SW846 3510C/8270D
Batch ID: 1673585	Inst: MSD1.I
Run Date: 06/14/2017 11:47	Analyst: JMB3
Prep Date: 06/13/2017 17:55	Aliquot: 1000 mL
Data File: s061417.B\slf1408.D	Column: 25x.20x.33
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.3	100	ug/L	60 (32%-124%)
2-Fluorobiphenyl	37.1	50.0	ug/L	74 (32%-112%)
2-Fluorophenol	34.1	100	ug/L	34 (15%-88%)
Nitrobenzene-d5	34.0	50.0	ug/L	68 (36%-115%)
Phenol-d5	20.8	100	ug/L	21 (15%-91%)
p-Terphenyl-d14	43.5	50.0	ug/L	87 (36%-121%)

Tentatively Identified Compound Summary

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

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

SDG Number: 2017-1716

Lab Sample ID: 1203810347

Client Sample: QC for batch 1673582

Client ID: LCS for batch 1673582

Batch ID: 1673585

Run Date: 06/14/2017 12:17

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1409.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		37.8	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		34.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		31.9	ug/L	3.00	10.0
122-66-7	Azobenzene		38.2	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		31.2	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		30.9	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		24.9	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		36.4	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		41.7	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		38.4	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		41.2	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.4	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		35.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		34.6	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		43.9	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		44.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		33.7	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		35.6	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		38.3	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		36.7	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		38.7	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		43.7	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		41.7	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		41.8	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		48.7	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		43.5	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.3	ug/L	3.00	10.0
83-32-9	Acenaphthene		41.1	ug/L	0.300	1.00
208-96-8	Acenaphthylene		38.7	ug/L	0.300	1.00
62-53-3	Aniline		38.5	ug/L	4.20	10.0
120-12-7	Anthracene		39.4	ug/L	0.300	1.00
1912-24-9	Atrazine		47.8	ug/L	3.00	10.0
92-87-5	Benzidine		51.7	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		44.7	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		44.4	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		44.7	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		43.8	ug/L	0.300	1.00

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

SDG Number: 2017-1716

Matrix: WATER

Lab Sample ID: 1203810347

Client Sample: QC for batch 1673582

Client: ARSL004

Project: QC

Client ID: LCS for batch 1673582

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1673585

Inst: MSD1.I

Dilution: 1

Run Date: 06/14/2017 12:17

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1409.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		43.8	ug/L	0.300	1.00
65-85-0	Benzoic acid		23.8	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.8	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		45.5	ug/L	3.00	10.0
218-01-9	Chrysene		43.9	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		42.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		45.3	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		45.9	ug/L	0.300	1.00
132-64-9	Dibenzofuran		39.3	ug/L	3.00	10.0
84-66-2	Diethylphthalate		45.1	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		44.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		37.7	ug/L	3.00	10.0
206-44-0	Fluoranthene		40.0	ug/L	0.300	1.00
86-73-7	Fluorene		42.0	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		41.9	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		34.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.8	ug/L	3.00	10.0
67-72-1	Hexachloroethane		31.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		46.4	ug/L	0.300	1.00
78-59-1	Isophorone		39.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		21.5	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		34.7	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		36.2	ug/L	3.00	10.0
91-20-3	Naphthalene		35.9	ug/L	0.300	1.00
98-95-3	Nitrobenzene		38.7	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		32.9	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.8	ug/L	0.300	1.00
108-95-2	Phenol		13.8	ug/L	3.00	10.0
129-00-0	Pyrene		42.9	ug/L	0.300	1.00
110-86-1	Pyridine		22.1	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		38.9	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		38.2	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		35.4	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		45.6	ug/L	3.00	10.0

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

Page 3 of 3

SDG Number: 2017-1716	Matrix: WATER
Lab Sample ID: 1203810347	
Client Sample: QC for batch 1673582	Client: ARSL004
Client ID: LCS for batch 1673582	Method: SW846 3510C/8270D
Batch ID: 1673585	Inst: MSD1.I
Run Date: 06/14/2017 12:17	Analyst: JMB3
Prep Date: 06/13/2017 17:55	Aliquot: 1000 mL
Data File: s061417.B\s1f1409.D	Column: 25x.20x.33
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		29.4	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.4	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		30.7	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		39.8	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		40.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.1	100	ug/L	81	(32%-124%)
2-Fluorobiphenyl	39.3	50.0	ug/L	79	(32%-112%)
2-Fluorophenol	43.9	100	ug/L	44	(15%-88%)
Nitrobenzene-d5	39.6	50.0	ug/L	79	(36%-115%)
Phenol-d5	25.1	100	ug/L	25	(15%-91%)
p-Terphenyl-d14	44.0	50.0	ug/L	88	(36%-121%)

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810348	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:18	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1411.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		65.6	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		59.2	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		55.1	ug/L	6.38	21.3
122-66-7	Azobenzene		68.2	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		52.4	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		52.9	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		56.5	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		64.2	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		77.1	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		68.0	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		73.2	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		71.0	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		63.0	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		86.2	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		80.4	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		77.9	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		58.3	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		62.2	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		88.5	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		63.3	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		69.1	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		76.4	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		74.7	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		76.8	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		84.4	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		76.4	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		42.9	ug/L	6.38	21.3
83-32-9	Acenaphthene		71.6	ug/L	0.638	2.13
208-96-8	Acenaphthylene		68.0	ug/L	0.638	2.13
62-53-3	Aniline		67.9	ug/L	8.94	21.3
120-12-7	Anthracene		75.0	ug/L	0.638	2.13
1912-24-9	Atrazine		82.6	ug/L	6.38	21.3
92-87-5	Benzidine		75.1	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		86.1	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		86.6	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		89.7	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		81.9	ug/L	0.638	2.13

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

SDG Number:	2017-1716	Date Collected:	06/09/2017 10:00	Matrix:	W
Lab Sample ID:	1203810348	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1673582	Client:	ARSL004	Project:	QC
Client ID:	MD50-17-138988MS	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1673585	Inst:	MSD1.I	Dilution:	1
Run Date:	06/14/2017 13:18	Analyst:	JMB3	Inj. Vol:	1 uL
Prep Date:	06/13/2017 17:55	Aliquot:	470 mL	Final Volume:	1 mL
Data File:	s061417.B\s1f1411.D	Column:	25x.20x.33		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		85.7	ug/L	0.638	2.13
65-85-0	Benzoic acid		119	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		60.1	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		86.7	ug/L	6.38	21.3
218-01-9	Chrysene		84.0	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		81.8	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		88.4	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		85.8	ug/L	0.638	2.13
132-64-9	Dibenzofuran		68.5	ug/L	6.38	21.3
84-66-2	Diethylphthalate		81.4	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		80.4	ug/L	6.38	21.3
88-85-7	Dinoseb	U	21.3	ug/L	6.38	21.3
122-39-4	Diphenylamine		68.0	ug/L	6.38	21.3
206-44-0	Fluoranthene		79.6	ug/L	0.638	2.13
86-73-7	Fluorene		73.7	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		75.7	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		57.6	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		33.6	ug/L	6.38	21.3
67-72-1	Hexachloroethane		51.4	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		85.7	ug/L	0.638	2.13
78-59-1	Isophorone		66.9	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		50.8	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	21.3	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	21.3	ug/L	6.38	21.3
621-64-7	N-Nitrosodi--n-propylamine		61.0	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		66.9	ug/L	6.38	21.3
91-20-3	Naphthalene		61.1	ug/L	0.638	2.13
98-95-3	Nitrobenzene		64.9	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	21.3	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		79.2	ug/L	6.38	21.3
85-01-8	Phenanthrene		73.6	ug/L	0.638	2.13
108-95-2	Phenol		39.6	ug/L	6.38	21.3
129-00-0	Pyrene		79.0	ug/L	0.638	2.13
110-86-1	Pyridine		51.3	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		66.4	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		64.2	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		58.1	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		90.8	ug/L	6.38	21.3

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810348	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:18	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1411.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		61.8	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		89.4	ug/L	6.38	21.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		61.3	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		72.4	ug/L	6.38	21.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		81.1	ug/L	6.38	21.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	148	213	ug/L	70 (32%-124%)
2-Fluorobiphenyl	67.0	106	ug/L	63 (32%-112%)
2-Fluorophenol	103	213	ug/L	48 (15%-88%)
Nitrobenzene-d5	66.2	106	ug/L	62 (36%-115%)
Phenol-d5	75.1	213	ug/L	35 (15%-91%)
p-Terphenyl-d14	81.7	106	ug/L	77 (36%-121%)

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810349	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:49	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1412.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		61.7	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		54.5	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		52.8	ug/L	6.38	21.3
122-66-7	Azobenzene		72.2	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		49.9	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		50.1	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		53.3	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		59.8	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		78.6	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		65.1	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		72.8	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		66.7	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		60.7	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		87.3	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		85.7	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		81.3	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		54.9	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		59.5	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		91.6	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		59.3	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		64.1	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		90.0	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		78.8	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		75.5	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		82.9	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		77.1	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		45.3	ug/L	6.38	21.3
83-32-9	Acenaphthene		69.2	ug/L	0.638	2.13
208-96-8	Acenaphthylene		66.9	ug/L	0.638	2.13
62-53-3	Aniline		67.8	ug/L	8.94	21.3
120-12-7	Anthracene		79.2	ug/L	0.638	2.13
1912-24-9	Atrazine		89.7	ug/L	6.38	21.3
92-87-5	Benzidine		98.8	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		87.8	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		90.8	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		89.4	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		90.8	ug/L	0.638	2.13

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810349	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:49	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1412.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		85.4	ug/L	0.638	2.13
65-85-0	Benzoic acid		119	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		58.9	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		87.0	ug/L	6.38	21.3
218-01-9	Chrysene		88.3	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		87.1	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		94.8	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		95.1	ug/L	0.638	2.13
132-64-9	Dibenzofuran		67.8	ug/L	6.38	21.3
84-66-2	Diethylphthalate		85.3	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		83.5	ug/L	6.38	21.3
88-85-7	Dinoseb	U	21.3	ug/L	6.38	21.3
122-39-4	Diphenylamine		73.1	ug/L	6.38	21.3
206-44-0	Fluoranthene		84.6	ug/L	0.638	2.13
86-73-7	Fluorene		75.8	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		81.6	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		56.0	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		30.4	ug/L	6.38	21.3
67-72-1	Hexachloroethane		50.3	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		98.2	ug/L	0.638	2.13
78-59-1	Isophorone		63.8	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		47.5	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	21.3	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	21.3	ug/L	6.38	21.3
621-64-7	N-Nitrosodi--n-propylamine		56.5	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		68.0	ug/L	6.38	21.3
91-20-3	Naphthalene		57.0	ug/L	0.638	2.13
98-95-3	Nitrobenzene		61.1	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	21.3	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		81.6	ug/L	6.38	21.3
85-01-8	Phenanthrene		79.7	ug/L	0.638	2.13
108-95-2	Phenol		38.4	ug/L	6.38	21.3
129-00-0	Pyrene		76.8	ug/L	0.638	2.13
110-86-1	Pyridine		50.5	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		62.7	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		61.3	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		56.0	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		92.9	ug/L	6.38	21.3

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810349	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:49	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1412.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		61.8	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		90.6	ug/L	6.38	21.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		58.3	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		74.4	ug/L	6.38	21.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		87.4	ug/L	6.38	21.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	158	213	ug/L	74	(32%-124%)
2-Fluorobiphenyl	64.9	106	ug/L	61	(32%-112%)
2-Fluorophenol	99.9	213	ug/L	47	(15%-88%)
Nitrobenzene-d5	62.5	106	ug/L	59	(36%-115%)
Phenol-d5	73.5	213	ug/L	35	(15%-91%)
p-Terphenyl-d14	81.3	106	ug/L	76	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

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:	1675216
Prep Batch Number:	1675214

Sample Analysis

Sample ID	Client ID
425329003	425329003 (CAWA-17-133330)
1203814204	Interference Check Sample (ICS)
1203814194	Method Blank (MB)
1203814195	Laboratory Control Sample (LCS)
1203814196	425115002(CAWA-17-133326) Matrix Spike (MS)
1203814197	425115002(CAWA-17-133326) 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 425115002 (CAWA-17-133326) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The recoveries of Perchlorate and Perchlorate-101 were not within the acceptance limits in 1203814196 (CAWA-17-133326MS) and 1203814197 (CAWA-17-133326MSD). This was due to the background concentration in the parent sample, 425115002 (CAWA-17-133326).

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

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: 24 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133330Date Received: 13-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 425329003Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.268	ug/L		1	19-JUN-17 20:38	per0619026a
	Perchlorate Isotope Ratio			2.71			1	19-JUN-17 20:38	per0619026a
14797-73-0	Perchlorate-101	.05	.2	0.288	ug/L		1	19-JUN-17 20:38	per0619026a
	Perchlorate-O(18)			0.399	ug/L		1	19-JUN-17 20:38	per0619026a

^ 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): 2017-1716

Extract Batch Code: 1675214

Date Filtered: 19-JUN-17

Matrix: WATER

Sample ID: 1203814195

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.189	ug/L	95		85 - 115
Perchlorate-O(18)		.439	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): 2017-1716

Extract Batch Code: 1675214

Date Extracted: 19-JUN-17

GEL MS/PS ID: 1203814196

Client ID: CAWA-17-133326

GEL MSD/PSD ID: 1203814197

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	1.05	ug/L	1.12	34 *	1.16	53 *	3	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.78		2.83		2		-
Perchlorate-101	0.200	1.05	ug/L	1.17	61 *	1.19	71 *	2	30	75 - 125
Perchlorate-O(18)	0	0.410	ug/L	0.415		.423		2		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 19-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814194Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate Isotope Ratio						1	19-JUN-17 18:15	per0619013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate-O(18)			0.475	ug/L		1	19-JUN-17 18:15	per0619013a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 19-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814195Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate Isotope Ratio			3.04			1	19-JUN-17 18:26	per0619014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate-O(18)			0.439	ug/L		1	19-JUN-17 18:26	per0619014a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814204Date Filtered: 19-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.186	ug/L	J	1	19-JUN-17 18:37	per0619015a
	Perchlorate Isotope Ratio			2.58			1	19-JUN-17 18:37	per0619015a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	19-JUN-17 18:37	per0619015a
	Perchlorate-O(18)			0.432	ug/L		1	19-JUN-17 18:37	per0619015a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDate Received: 09-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814196Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.12	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 18:59	per0619017a
14797-73-0	Perchlorate-101	.05	.2	1.17	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate-O(18)			0.415	ug/L		1	19-JUN-17 18:59	per0619017a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDDate Received: 09-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814197Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.16	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate Isotope Ratio			2.83			1	19-JUN-17 19:10	per0619018a
14797-73-0	Perchlorate-101	.05	.2	1.19	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate-O(18)			0.423	ug/L		1	19-JUN-17 19:10	per0619018a

^ 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 #: 2017-1716
Work Order #: 425329**

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: 1673869

Prep Batch Number: 1673868

Sample Analysis

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

Sample ID	Client ID
425329002	CAWA-17-133302
425329006	CAWA-17-135753
1203811082	Method Blank (MB)
1203811083	Laboratory Control Sample (LCS)
1203811084	425329006(CAWA-17-135753) Matrix Spike (MS)
1203811085	425329006(CAWA-17-135753) 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 continuing calibration verification standards (CCV) have not met requirements of 80-120% for in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low CCV with all target analytes meeting acceptance limits. Since the target analyte was not detected in the associated samples, the data are reported.

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

The Low Level Calibration Verification Standard (CRI) did not meet requirements of 70-130% for samples in this SDG. Please refer to Form 7 of the data package for a list of recoveries. Since the recoveries are biased high and target analytes were not detected in the associated samples, the data are considered unaffected. The data are reported.

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 425329006 (CAWA-17-135753) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. Since similar recoveries were observed, the non-conforming recoveries are attributed to sample matrix interference. The data are reported.

Sample	Analyte	Value
1203811084 (CAWA-17-135753MS)	Tetryl	38* (50%-126%)
1203811085 (CAWA-17-135753MSD)	Tetryl	45* (50%-126%)

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

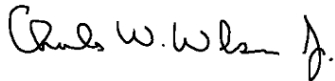
The Qualifiers in this report are defined as follows:

- * 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: 10 JUL 2017

Title: Analyst II

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133302

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329002

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706026.wiff

Date Analyzed: 07-JUL-17 00:34

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.266	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.266	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.266	U	0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.266	U	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.266	U	0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.266	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.266	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.266	U	0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.266	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.266	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.266	U	0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.266	U	0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.532	U	0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133302

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329002

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329006

Sample Amount 925 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706027.wiff

Date Analyzed: 07-JUL-17 01:08

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.27	U	0.0865	0.270
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.27	U	0.0865	0.270
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.27	U	0.0865	0.270
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.27	U	0.0865	0.270
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.27	U	0.0865	0.270
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.27	U	0.0865	0.270
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.27	U	0.0865	0.270
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.27	U	0.0886	0.270
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.27	U	0.0865	0.270
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.27	U	0.0865	0.270
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.27	U	0.0865	0.270
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.27	U	0.0865	0.270
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.541	U	0.0865	0.541
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329006

Sample Amount 925 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.541	U	0.108	0.541
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.541	U	0.162	0.541
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.08	U	0.324	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	U	0.324	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.324	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.7	U	0.541	2.70
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.7	U	0.541	2.70
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1716**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425329002	CAWA-17-133302	91	55 - 115	
425329006	CAWA-17-135753	97	55 - 115	
1203811082	MB for batch 1673868	97	55 - 115	
1203811083	LCS for batch 1673868	90	55 - 115	
1203811084	CAWA-17-135753MS	92	55 - 115	
1203811085	CAWA-17-135753MSD	91	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) 2017-1716

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL LCS ID: 1203811083

GEL LCSDUP ID: .

Analysis Date/Time: 06-JUL-17 19:27

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
2,6-Dinitrotoluene	5	4.23	85					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.6	92					70 - 112
3,5-Dinitroaniline	5	4.79	96					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.7	94					74 - 116
HMX	5	3.87	77					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.76	95					57 - 126
RDX	5	4.13	83					64 - 117
TATB	2.5	1.7	68					47 - 135
Tetryl	5	2.94	59					55 - 122
m-Dinitrobenzene	5	4.42	88					74 - 117
m-Nitrotoluene	5	4.15	83					66 - 114
o-Nitrotoluene	5	4.32	86					64 - 115
p-Nitrotoluene	5	4.55	91					66 - 127
tris(o-cresyl) phosphate	5	2.32	46					43 - 104
1,3,5-Trinitrobenzene	5	4.68	94					70 - 110
2,4,6-Trinitrotoluene	5	4.76	95					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.41	88					50 - 121
2,4-Dinitrotoluene	5	4.46	89					71 - 110
2,6-Diamino-4-nitrotoluene	5	5.18	104					53 - 127

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL Spike ID: 1203811084

GEL SpikeDup ID: 1203811085

Analysis Date/Time: 07-JUL-17 01:42

MSD Analysis Date/Time: 07-JUL-17 02:16

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	5.55556	0	4.99	90	4.7	85	6	30	67 - 111
2,4,6-Trinitrotoluene	5.55556	0	5.11	92	5.62	102	9	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.55556	0	5.1	92	6.5	118	24	30	50 - 121
2,4-Dinitrotoluene	5.55556	0	4.77	86	5.41	98	13	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.55556	0	5.82	105	5.77	104	1	30	53 - 127
2,6-Dinitrotoluene	5.55556	0	4.63	83	4.94	89	6	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.55556	0	4.8	86	5.1	92	6	30	67 - 115
3,5-Dinitroaniline	5.55556	0	5.43	98	5.61	102	3	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.55556	0	5.11	92	5.44	98	6	30	65 - 120
HMX	5.55556	0	4.24	76	3.94	71	7	30	44 - 128
Nitrobenzene	5.55556	0	4.3	77	4.4	80	2	30	62 - 116
PETN	5.55556	0	4.77	86	5.41	98	13	30	51 - 131
RDX	5.55556	.012	4.65	83	4.18	75	11	30	57 - 125
TATB	2.77778	0	2.04	74	1.8	65	13	30	38 - 149
Tetryl	5.55556	0	2.11	38 *	2.51	45 *	17	30	50 - 126
m-Dinitrobenzene	5.55556	0	5.04	91	5.17	94	3	30	74 - 117
m-Nitrotoluene	5.55556	0	4.27	77	4.59	83	7	30	59 - 120
o-Nitrotoluene	5.55556	0	3.82	69	4.13	75	8	30	56 - 119
p-Nitrotoluene	5.55556	0	4.45	80	4.59	83	3	30	61 - 129
tris(o-cresyl) phosphate	5.55556	0	2.99	54	3.43	62	14	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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706016.wiff

Date Analyzed: 06-JUL-17 18:53

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706017.wiff

Date Analyzed: 06-JUL-17 19:27

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.7		0.300	1.00
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.32		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
479-45-8	Tetryl	2.94		0.080	0.500
479-45-8	Tetryl				
2691-41-0	HMX	3.87		0.080	0.250
2691-41-0	HMX				
121-82-4	RDX	4.13		0.080	0.250
121-82-4	RDX				
99-08-1	m-Nitrotoluene	4.15		0.080	0.250
99-08-1	m-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.23		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
98-95-3	Nitrobenzene	4.29		0.080	0.250
98-95-3	Nitrobenzene				
88-72-2	o-Nitrotoluene	4.32		0.082	0.250
88-72-2	o-Nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.41		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
99-65-0	m-Dinitrobenzene	4.42		0.080	0.250
99-65-0	m-Dinitrobenzene				
121-14-2	2,4-Dinitrotoluene	4.46		0.080	0.250
121-14-2	2,4-Dinitrotoluene				
99-99-0	p-Nitrotoluene	4.55		0.150	0.500
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	4.6		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.68		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.7		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.76		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	4.76		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
618-87-1	3,5-Dinitroaniline	4.79		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.18		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706028.wiff

Date Analyzed: 07-JUL-17 01:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.04		0.333	1.11
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.11		0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	2.99		0.333	1.11
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
88-72-2	o-Nitrotoluene	3.82		0.0911	0.278
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
2691-41-0	HMX	4.24		0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				
99-08-1	m-Nitrotoluene	4.27		0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.3		0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.45		0.167	0.556
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.63		0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-82-4	RDX	4.65		0.0889	0.278
<i>121-82-4</i>	<i>RDX</i>				
121-14-2	2,4-Dinitrotoluene	4.77		0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	4.77		0.111	0.556
<i>78-11-5</i>	<i>PETN</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.8		0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	4.99		0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.04		0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.1		0.556	2.78
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.11		0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.11		0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.43		0.333	1.11
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.82		0.556	2.78
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706029.wiff

Date Analyzed: 07-JUL-17 02:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.8		0.331	1.10
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.51		0.0884	0.552
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	3.43		0.331	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	3.94		0.0884	0.276
<i>2691-41-0</i>	<i>HMX</i>				
88-72-2	o-Nitrotoluene	4.13		0.0906	0.276
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.18		0.0884	0.276
<i>121-82-4</i>	<i>RDX</i>				
98-95-3	Nitrobenzene	4.4		0.0884	0.276
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.59		0.0884	0.276
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.59		0.166	0.552
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.7		0.0884	0.276
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.94		0.0884	0.276
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.1		0.0884	0.276
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.17		0.0884	0.276
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	5.41		0.0884	0.276
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	5.41		0.110	0.552
<i>78-11-5</i>	<i>PETN</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.44		0.0884	0.276
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.61		0.331	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
118-96-7	2,4,6-Trinitrotoluene	5.62		0.0884	0.276
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.77		0.552	2.76
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.5		0.552	2.76
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1716Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:20GEL Data File: EXP0706001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	1.11
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1716Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:55GEL Data File: EXP0706002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 06-JUL-17 15:28

GEL Data File: EXP0706010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.68
tris(o-cresyl) phosphate	0	11.24
TATB	0	1.35
3,5-Dinitroaniline	0	1.88
2,4-Diamino-6-nitrotoluene	0	1.38
2,6-Diamino-4-nitrotoluene	0	1.71
1,3,5-Trinitrobenzene	0	1.64
2,4,6-Trinitrotoluene	0	1.88
2,4-Dinitrotoluene	0	1.85
2,6-Dinitrotoluene	0	1.71
2-Amino-4,6-dinitrotoluene	0	1.75
4-Amino-2,6-dinitrotoluene	0	2.03
HMX	0	2.05
Nitrobenzene	0	0
Nitroglycerin	0	3.38
PETN	0	3.24
RDX	0	1.77
Tetryl	0	1.74
m-Dinitrobenzene	0	1.58
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): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 06-JUL-17 17:44

GEL Data File: EXP0706014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	7.71
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	.97
RDX	0	0
Tetryl	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 06-JUL-17 21:43

GEL Data File: EXP0706021.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 06-JUL-17 23:26

GEL Data File: EXP0706024.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	.99
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.04
tris(o-cresyl) phosphate	0	7.15
TATB	0	0
3,5-Dinitroaniline	0	.96
2,4-Diamino-6-nitrotoluene	0	.97
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	.86
2,4,6-Trinitrotoluene	0	1.19
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	.87
4-Amino-2,6-dinitrotoluene	0	1.03
HMX	0	.88
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.92
RDX	0	.87
Tetryl	0	1.04

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 07-JUL-17 02:50

GEL Data File: EXP0706030.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	10.65
TATB	0	0
3,5-Dinitroaniline	0	1.1
2,4-Diamino-6-nitrotoluene	0	1.2
2,6-Diamino-4-nitrotoluene	0	1.33
1,3,5-Trinitrobenzene	0	1.02
2,4,6-Trinitrotoluene	0	1.27
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.19
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.11
Nitrobenzene	0	1.25
Nitroglycerin	0	1.42
PETN	0	2.8
RDX	0	.83
Tetryl	0	.78
m-Dinitrobenzene	0	.93
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): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 07-JUL-17 03:59

GEL Data File: EXP0706032.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	.89
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.06
tris(o-cresyl) phosphate	0	6.27
TATB	0	0
3,5-Dinitroaniline	0	.92
2,4-Diamino-6-nitrotoluene	0	.99
2,6-Diamino-4-nitrotoluene	0	0
1,3,5-Trinitrobenzene	0	.85
2,4,6-Trinitrotoluene	0	1.07
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.03
4-Amino-2,6-dinitrotoluene	0	1.14
HMX	0	1
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.79
RDX	0	.85
Tetryl	0	1

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329

Sample ID	Client ID
425329002	CAWA-17-133302
425329003	CAWA-17-133330
1203813734	Method Blank (MB) ICP
1203813735	Laboratory Control Sample (LCS)
1203813738	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813736	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813737	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203813739	Method Blank (MB) ICP-MS
1203813740	Laboratory Control Sample (LCS)
1203813743	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813741	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813742	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203811040	Method Blank (MB) CVAA
1203811041	Laboratory Control Sample (LCS)
1203811046	425358001(NonSDGL) Serial Dilution (SD)
1203811042	425358001(NonSDGD) Sample Duplicate (DUP)
1203811044	425358001(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 425329002 and 003 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1675026, 1675028, 1673861 and 1679789
Prep Batch :	1675025, 1675027 and 1673859
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 30, GL-MA-E-010 REV# 34 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 P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The 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: 425329003 (CAWA-17-133330)-ICP and ICP-MS and 425358001 (NonSDG)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate

value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

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: 05 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425329002**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133302**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/15/17 13:14	061517W1-3	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425329003**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133330**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/15/17 13:16	061517W1-3	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425329003

BASIS: As Received

DATE COLLECTED 08-JUN-17

CLIENT ID: CAWA-17-133330

LEVEL: Low

DATE RECEIVED 13-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-38-2	Arsenic	2.53	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-39-3	Barium	12.2	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-70-2	Calcium	8810	ug/L		50	200	200	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7439-95-4	Magnesium	2560	ug/L		110	300	300	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-98-7	Molybdenum	2.55	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-09-7	Potassium	1520	ug/L		50	150	150	1	P	HSC	06/28/17 19:00	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7631-86-9	Silica	57300	ug/L		53	213	213	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-23-5	Sodium	14000	ug/L		100	300	300	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-24-6	Strontium	59.8	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-61-1	Uranium	0.915	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-62-2	Vanadium	8.58	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425329003**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133330**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	32.6	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1716

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>
1203811040	Mercury	0.067	ug/L	+/-1	U	AV	0.067	1
1203813734	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	105	ug/L	+/-200	J	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	3.3	ug/L	+/-10	U	P	3.3	10
1203813739	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

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID: WT_ESR-17-137413S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 425358001 Spike ID: 1203811044

<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	2.15		0.067	U	2	107		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID: CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813737

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4750		68	U	5000	94.9		P
Barium	ug/L	75-125	501		12.2		500	97.8		P
Beryllium	ug/L	75-125	497		1	U	500	99.3		P
Boron	ug/L	75-125	514		15	U	500	101		P
Calcium	ug/L	75-125	13100		8810		5000	86.3		P
Cobalt	ug/L	75-125	493		1	U	500	98.7		P
Copper	ug/L	75-125	510		3	U	500	102		P
Iron	ug/L	75-125	4870		30	U	5000	97		P
Magnesium	ug/L	75-125	7250		2560		5000	93.8		P
Manganese	ug/L	75-125	483		2	U	500	96.5		P
Potassium	ug/L	75-125	6390		1520		5000	97.4		P
Silica	ug/L		60300		57300		10700	28.2	N/A	P
Sodium	ug/L	75-125	18400		14000		5000	88.8		P
Strontium	ug/L	75-125	530		59.8		500	94.1		P
Tin	ug/L	75-125	496		2.5	U	500	99		P
Vanadium	ug/L	75-125	509		8.58		500	100		P
Zinc	ug/L	75-125	469		3.3	U	500	93.3		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813742

<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	50.4		1	U	50	99.5		MS
Arsenic	ug/L	75-125	50.5		2.53	J	50	95.9		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.5		3	U	50	97.1		MS
Lead	ug/L	75-125	49.4		0.5	U	50	98.6		MS
Molybdenum	ug/L	75-125	53.8		2.55		50	103		MS
Nickel	ug/L	75-125	48.3		0.6	U	50	95.9		MS
Selenium	ug/L	75-125	49.8		2	U	50	99.3		MS
Silver	ug/L	75-125	49		0.3	U	50	98.1		MS
Thallium	ug/L	75-125	47.2		0.6	U	50	94.3		MS
Uranium	ug/L	75-125	49.2		0.915		50	96.6		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
–6–
Duplicate Sample Summary

SDG No.: 2017–1716**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_ESR–17–137413D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 425358001**Duplicate ID:** 1203811042**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1716

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813736

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	12.2		11.8		3.72		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	8810		8640		1.99		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%	2560		2510		2.13		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1520		1560		2.4		P
Silica	ug/L	+/-20%	57300		55800		2.64		P
Sodium	ug/L	+/-20%	14000		13900		.781		P
Strontium	ug/L	+/-20%	59.8		58.4		2.37		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	8.58		8.34		2.83		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1716

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813741

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.53 J		2.45 J		3.25		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	+/-20%	2.55		2.58		1.33		MS
Nickel	ug/L		0.6 U		0.6 U				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	0.915		0.883		3.56		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203811041	Mercury	ug/L	2	2.16		108	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203813735								
	Aluminum	ug/L	5000	5240		105	80-120	P
	Barium	ug/L	500	535		107	80-120	P
	Beryllium	ug/L	500	532		106	80-120	P
	Boron	ug/L	500	540		108	80-120	P
	Calcium	ug/L	5000	5280		106	80-120	P
	Cobalt	ug/L	500	531		106	80-120	P
	Copper	ug/L	500	539		108	80-120	P
	Iron	ug/L	5000	5340		107	80-120	P
	Magnesium	ug/L	5000	5380		108	80-120	P
	Manganese	ug/L	500	532		106	80-120	P
	Potassium	ug/L	5000	5400		108	80-120	P
	Silica	ug/L	10700	11100		104	80-120	P
	Sodium	ug/L	5000	5450		109	80-120	P
	Strontium	ug/L	500	525		105	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	535		107	80-120	P
	Zinc	ug/L	500	504		101	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203813740								
	Thallium	ug/L	50	48.7		97.3	80-120	MS
	Uranium	ug/L	50	49		98	80-120	MS
	Antimony	ug/L	50	49.8		99.6	80-120	MS
	Arsenic	ug/L	50	50.5		101	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	56.2		112	80-120	MS
	Lead	ug/L	50	50.2		100	80-120	MS
	Molybdenum	ug/L	50	50.6		101	80-120	MS
	Nickel	ug/L	50	54		108	80-120	MS
	Selenium	ug/L	50	50.6		101	80-120	MS
	Silver	ug/L	50	50.1		100	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716 **Client ID:** WT_ESR-17-137413L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 425358001 **Serial Dilution ID:** 1203811046

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813738

<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	12.2		12	J	2.237			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	8810		8460		4.014		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2560		2580		.488			P
Manganese	2	U	10	U				P
Potassium	1520		1530		.553			P
Silica	57300		54700		4.583		10	P
Sodium	14000		14500		3.791		10	P
Strontium	59.8		58.9		1.463		10	P
Tin	2.5	U	12.5	U				P
Vanadium	8.58		5.76	J	32.8			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716 **Client ID:** CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 425329003 **Serial Dilution ID:** 1203813743

<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	2.53	J	10	U	28.346			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.55		2.56		.589			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.915		.885	J	3.279			MS

*Analytical Methods:

MS SW846 3005A/6020A

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1673634

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
425329002	CAWA-17-133302
1203812102	Method Blank (MB)
1203812103	Laboratory Control Sample (LCS)
1203812277	Laboratory Control Sample Duplicate (LCSD)
1203812105	425300003(CAWA-17-133305) Sample Duplicate (DUP)
1203812107	425300003(CAWA-17-133305) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

Quality Control (QC) Designation

Sample 425300003 (CAWA-17-133305) 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:	Cyanide and Total		
Analytical Batch:	1673690	Method:	WSP-CN(T)
Prep Batch :	1673689	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
425329002	CAWA-17-133302
1203810623	Method Blank (MB)
1203810624	Laboratory Control Sample (LCS)
1203810625	425300001(CAWA-17-133280) Sample Duplicate (DUP)
1203810627	425300001(CAWA-17-133280) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 19.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

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 425300001 (CAWA-17-133280) 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

Sample1203810624 (LCS) was re-analyzed to verify the result.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1673741

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810741	Method Blank (MB)
1203810742	Laboratory Control Sample (LCS)
1203810743	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203810744	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203810743 (CAWA-17-133314DUP) and 1203810744 (CAWA-17-133314PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS) and 425329003 (CAWA-17-133330) 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:	1673875	Method:	NH3
Prep Batch :	1673874	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
425329003	CAWA-17-133330
1203811097	Method Blank (MB)
1203811098	Laboratory Control Sample (LCS)
1203811099	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811100	425079002(CAWA-17-133314) 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+ 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 425079002 (CAWA-17-133314) 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 Kjeldahl Nitrogen		
Analytical Batch:	1673872	Method:	TKN
Prep Batch :	1673870	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
425329002	CAWA-17-133302
1203811089	Method Blank (MB)
1203811090	Laboratory Control Sample (LCS)
1203811091	425079001(CAWA-17-133286) Sample Duplicate (DUP)
1203811092	425079001(CAWA-17-133286) 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 425079001 (CAWA-17-133286) 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

Samples 1203811089 (MB), 1203811090 (LCS), 1203811091 (CAWA-17-133286DUP), 1203811092 (CAWA-17-133286MS) and 425329002 (CAWA-17-133302) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. Sample 425329002 (CAWA-17-133302) was re-analyzed to verify the result.

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: 1673698

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810634	Method Blank (MB)
1203810635	Laboratory Control Sample (LCS)
1203810636	425316001(MD50-17-138988) Sample Duplicate (DUP)
1203810637	425316001(MD50-17-138988) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425316001 (MD50-17-138988) 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:	1673877	Method:	PO4
Prep Batch :	1673876	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
425329003	CAWA-17-133330
1203811104	Method Blank (MB)
1203811105	Laboratory Control Sample (LCS)
1203811108	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811109	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) 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

Samples 1203811104 (MB) and 1203811105 (LCS) were 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:
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: 1673670

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810569	Method Blank (MB)
1203810570	Laboratory Control Sample (LCS)
1203810572	425300002(CAWA-17-133308) 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 425300002 (CAWA-17-133308) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1679220

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
425329003	CAWA-17-133330
1203823672	Laboratory Control Sample (LCS)
1203823673	425329003(CAWA-17-133330) 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

Sample 425329003 (CAWA-17-133330) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1675817 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203815599	Laboratory Control Sample (LCS)
1203815600	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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
1203815600 (CAWA-17-133330DUP)	pH	Received 13-JUN-17, out of holding 08-JUN-17
425329003 (CAWA-17-133330)	pH	Received 13-JUN-17, out of holding 08-JUN-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: 1675815 **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
425329003	CAWA-17-133330
1203815591	Laboratory Control Sample (LCS)
1203815593	425329003(CAWA-17-133330) Sample Duplicate (DUP)
1203815594	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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: 2017-1716 GEL Work Order: 425329

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: 07 JUL 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: July 7, 2017

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

Los Alamos, New Mexico 87545

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133302
Sample ID: 425329002
Matrix: W
Collect Date: 08-JUN-17 11:53
Receive Date: 13-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	06/22/17	0604	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1115	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1045	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 2017

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

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133330
Sample ID: 425329003
Matrix: W
Collect Date: 08-JUN-17 11:53
Receive Date: 13-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/13/17	2357	1673741	1
Chloride		1.67	0.067	0.200	mg/L		1					
Fluoride		0.142	0.033	0.100	mg/L		1					
Sulfate		4.98	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.040	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1142	1673875	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.388	0.017	0.050	mg/L		1	AXH3	06/14/17	0854	1673698	3
PO4 "As Received"												
Phosphorus, Total as P		0.0741	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1050	1673877	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		117	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		60.4	1.45	4.00	mg/L			RXB5	06/22/17	1841	1675815	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		172	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0912	1679220	7
PH "As Received"												
pH at Temp 20.1C	H	8.21	0.010	0.100	SU		1	RXB5	06/22/17	1840	1675817	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 2017

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

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133330
Sample ID: 425329003

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 7, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 425329

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1673634										
QC1203812105	425300003	DUP									
Total Organic Carbon Average		1.84		1.82	mg/L	1.15	^	(+/-1.00)	TSM	06/22/17	03:43
QC1203812103	LCS										
Total Organic Carbon Average	10.0			9.81	mg/L			98.1 (80%-120%)		06/21/17	17:57
QC1203812277	LCSD										
Total Organic Carbon Average	10.0			9.89	mg/L	0.873		98.9 (0%-20%)		06/21/17	18:09
QC1203812102	MB										
Total Organic Carbon Average			U	ND	mg/L					06/21/17	17:45
QC1203812107	425300003	PS									
Total Organic Carbon Average	10.0	1.84		11.1	mg/L			92.9 (75%-125%)		06/22/17	04:30
Flow Injection Analysis											
Batch	1673690										
QC1203810625	425300001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/15/17	11:06
QC1203810624	LCS										
Cyanide, Total	50.0			52.8	ug/L			106 (90%-110%)		06/15/17	11:04
QC1203810623	MB										
Cyanide, Total			U	ND	ug/L					06/15/17	10:57
QC1203810627	425300001	MS									
Cyanide, Total	100	U	ND	110	ug/L			110 (90%-110%)		06/15/17	11:07

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
QC1203810743	425079002	DUP									
Bromide	J	0.0867	J	0.0848	mg/L	2.22	^	(+/-0.200)	MXL2	06/13/17	21:03
Chloride		13.8		13.8	mg/L	0.084		(0%-20%)		06/14/17	14:46
Fluoride		0.171		0.169	mg/L	1	^	(+/-0.100)		06/13/17	21:03
Sulfate		6.08		5.94	mg/L	2.35		(0%-20%)			
QC1203810742	LCS										
Bromide	1.25			1.26	mg/L			101	(80%-120%)	06/13/17	20:06
Chloride	5.00			4.72	mg/L			94.3	(80%-120%)		
Fluoride	2.50			2.45	mg/L			97.9	(80%-120%)		
Sulfate	10.0			9.78	mg/L			97.8	(80%-120%)		
QC1203810741	MB										
Bromide			U	ND	mg/L					06/13/17	19:37
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203810744	425079002	PS									
Bromide	1.25	J	0.0867	1.31	mg/L			97.8	(75%-125%)	06/13/17	21:32
Chloride	5.00		6.91	12.4	mg/L			110	(75%-125%)	06/14/17	15:15

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
Fluoride	2.50	0.171		2.57	mg/L		96	(75%-125%)	MXL2	06/13/17	21:32
Sulfate	10.0	6.08		16.3	mg/L		102	(75%-125%)			
Nutrient Analysis											
Batch	1673698										
QC1203810636	425316001	DUP									
Nitrogen, Nitrate/Nitrite		0.593		0.595	mg/L	0.337		(0%-20%)	AXH3	06/14/17	08:52
QC1203810635	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.980	mg/L		98	(90%-110%)		06/14/17	08:49
QC1203810634	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/14/17	08:48
QC1203810637	425316001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.593		1.55	mg/L		95.7	(90%-110%)		06/14/17	08:53
Batch	1673872										
QC1203811091	425079001	DUP									
Nitrogen, Total Kjeldahl		U	ND	J	0.038	mg/L	200		KLP1	06/21/17	09:54
QC1203811090	LCS										
Nitrogen, Total Kjeldahl	1.00			1.10	mg/L		110	(90%-110%)		06/21/17	09:50
QC1203811089	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					06/21/17	09:50
QC1203811092	425079001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.974	mg/L		97.4	(90%-110%)		06/21/17	09:55
Batch	1673875										
QC1203811099	425079002	DUP									
Nitrogen, Ammonia		0.0967		0.0902	mg/L	6.96	^	(+/-0.050)	KLP1	06/15/17	11:36

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1673875										
QC1203811098	LCS										
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)	KLP1	06/15/17	11:28
QC1203811097	MB										
Nitrogen, Ammonia			U	ND	mg/L					06/15/17	11:27
QC1203811100	425079002	MS									
Nitrogen, Ammonia	1.00	0.0967		1.03	mg/L		93.3	(90%-110%)		06/15/17	11:37
Batch	1673877										
QC1203811108	425079002	DUP									
Phosphorus, Total as P		0.0742		0.0979	mg/L	27.5	^	(+/-0.050)	KLP1	06/20/17	10:29
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L		97.5	(80%-124%)		06/20/17	10:38
QC1203811104	MB										
Phosphorus, Total as P			J	0.0324	mg/L					06/20/17	10:38
QC1203811109	425079002	MS									
Phosphorus, Total as P	1.00	0.0742		1.23	mg/L		116	(63%-139%)		06/20/17	10:30
Solids Analysis											
Batch	1673670										
QC1203810572	425300002	DUP									
Total Dissolved Solids		121		123	mg/L	1.17		(0%-5%)	KLP1	06/15/17	15:44
QC1203810570	LCS										
Total Dissolved Solids	300			296	mg/L		98.6	(95%-105%)		06/15/17	15:44
QC1203810569	MB										
Total Dissolved Solids			U	ND	mg/L					06/15/17	15:44

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1675815										
QC1203815593	425329003	DUP									
Alkalinity, Total as CaCO3		60.4		60.6	mg/L	0.331		(0%-20%)	RXB5	06/22/17	18:42
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203815591	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		06/22/17	18:02
QC1203815594	425329003	MS									
Alkalinity, Total as CaCO3	100	60.4		165	mg/L		105	(80%-120%)		06/22/17	18:43
Batch	1675817										
QC1203815600	425329003	DUP									
pH	H	8.21	H	8.19	SU	0.244		(0%-5%)	RXB5	06/22/17	18:42
QC1203815599	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		06/22/17	18:25
Batch	1679220										
QC1203823673	425329003	DUP									
Conductivity		172		172	umhos/cm	0		(0%-10%)	SXM7	07/06/17	09:16
QC1203823672	LCS										
Conductivity	1410			1370	umhos/cm		96.7	(95%-105%)		07/06/17	09:05

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 6 of 6

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

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

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

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

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

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

July 19, 2017

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

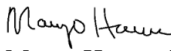
Re: LANL- WQH Water Samples
Work Order: 425329
SDG: 2017-1716

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 13, 2017, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package has been revised to include the results for DNX, MNX, and TNX on the Form 1s.

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

Sincerely,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-1716
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 425329
SDG: 2017-1716

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	13
Volatile Analysis.....	16
Case Narrative.....	17
Sample Data Summary.....	22
Quality Control Summary.....	32
Quality Control Data.....	50
Semi-Volatile Analysis.....	72
Case Narrative.....	73
Sample Data Summary.....	78
Quality Control Summary.....	85
Quality Control Data.....	100
Perchlorates by LCMSMS Analysis.....	113
Case Narrative.....	114
Sample Data Summary.....	120
Quality Control Summary.....	122
Quality Control Data.....	125
Explosives by LCMSMS Analysis.....	131
Case Narrative.....	132

Sample Data Summary.....	137
Quality Control Summary.....	142
Quality Control Data.....	146
Metals Analysis.....	163
Case Narrative.....	164
Sample Data Summary.....	169
Quality Control Summary.....	174
General Chem Analysis.....	188
Case Narrative.....	189
Sample Data Summary.....	220
Quality Control Summary.....	224

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 425329
SDG # : 2017-1716**

July 10, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 13, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container 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>
425329001	CAWA-17-133302
425329002	CAWA-17-133302
425329003	CAWA-17-133330
425329004	CAWA-17-133340
425329005	CAWA-17-133345
425329006	CAWA-17-135753

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.

Margo Herron
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 10 July 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	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

General Engineering		COC/Lab Request #:	
Charleston	SC	2017-1716	
		Page 1 of 1	
Chain of Custody/Analysis Request		Site Name: Los Alamos National Laboratory	
Lab Agreement #:		Rad Screening Info:	
Project Number: ADEP		Lab Reporting Limit Type:	
Analysis Turnaround Time:		Sample Quantitation Limit	
24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/>			
7 Days - <input type="checkbox"/>			
14 Days - <input type="checkbox"/>			
21 Days - <input type="checkbox"/>			
28 Days - <input checked="" type="checkbox"/>			
Field Sample ID	Sample Date	Sample Time	Sample Matrix
CAWA-17-133302	Jun 8 2017	11:53	W
CAWA-17-133330	Jun 8 2017	11:53	W
CAWA-17-133340	Jun 8 2017	11:53	W
CAWA-17-133345	Jun 8 2017	11:53	W
CAWA-17-135753	Jun 8 2017	12:26	W
Special Instructions:			
Relinquished by: [Signature]			
Relinquished by: [Signature]			
Relinquished by: [Signature]			

Special Instructions:



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 125329	
Received By: ZKW		Date Received: 6/13/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input checked="" type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1782 1970 -5c 5908 1782 1960 -6c 5908 1782 1959 -6c 5908 1782 2050 -6c 5908 1782 2040 -5c 5908 1782 2017 -6c 5908 1782 1937 -24c 5908 1782 1948 -5c 5908 1782 2061 -5c	
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/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input 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 See TEMP: 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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: Metals cont. for WST-139346 rec'd unpreserved 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: Both vials for -139346 and All vials for -139347, -348, -349, 350, and 351 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: BOD sample for -139348 rec'd out of hold
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	We rec'd a ptt container for WST-139351
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 **AM**Date **6/17/17**

Page ____ of ____

GL-CHL-SR-001 Rev 5

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12 JUN 17
ACTUAL: 52.0 LB MAN
CAD: 0014176/CAFE2916

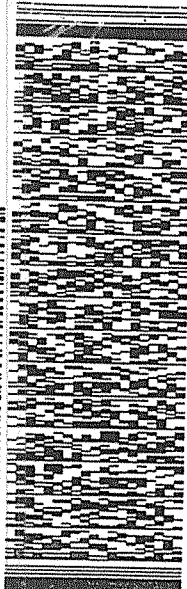
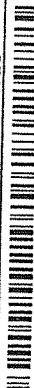
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express

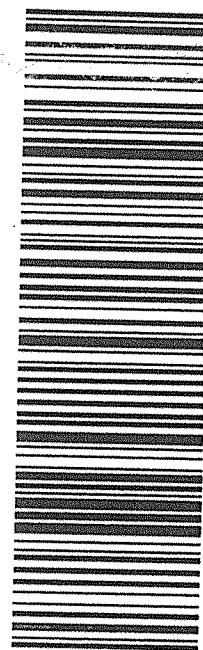
TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# 5908 1782 1970

Mstr# 5908 1782 1960

X7 RBWA

29407
SC-US CHS



Part # 156149V-434 R1T2 06/15

ORIGIN ID:SAFA (505) 565-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

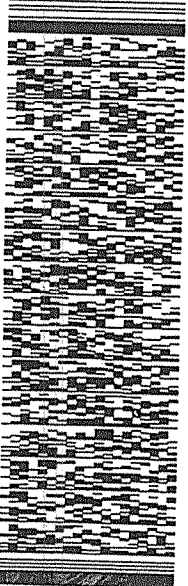
CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express

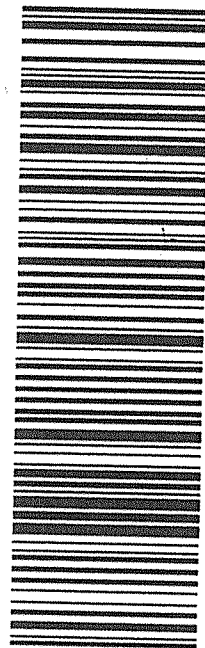


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

MPS# 5908 1782 2050
Mstr# 5908 1782 2040

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

RT 0
FZ 0

2050
06.13

ORIGIN ID:SAFA (505) 565-9966
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 12JUN17
ACTWGT: 59.0 LB MAN
CAD: 0014176/CAFE2916

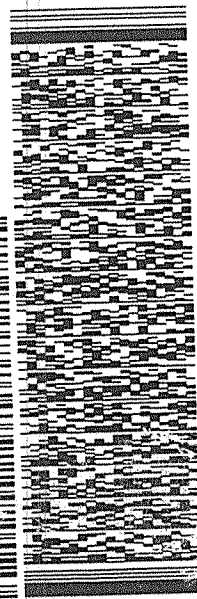
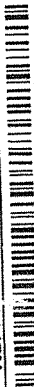
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express

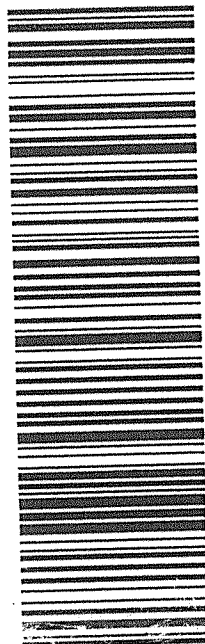


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

MPS# 5908 1782 2061
Mstr# 5908 1782 2040

X7 RBWA

29407
SC-US CHS



Part # 156148V-434 RIT2 06/15

538C1/4502/329B

41513150513074

SHIP DATE: 12 JUN 17
ACTWGT: 24.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

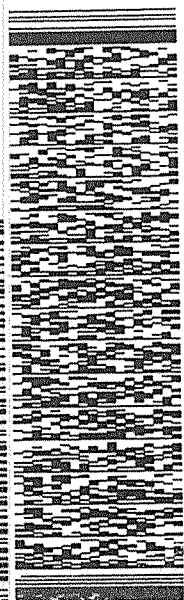
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDDASRGW04BAGWEO

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

TRK# 5908 1782 2040

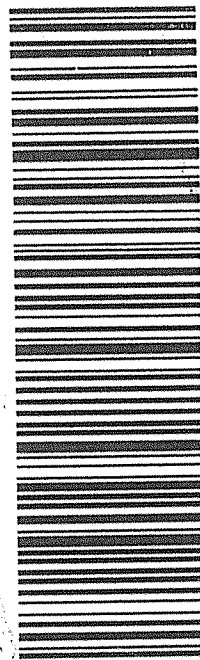
0201

MASTER

X7 RBWA

29407

SC-US CHS



Part # 156148V-434 HIT2 06/15
434 NEW USW12 PRD

SHIP DATE: 12 JUN 17
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

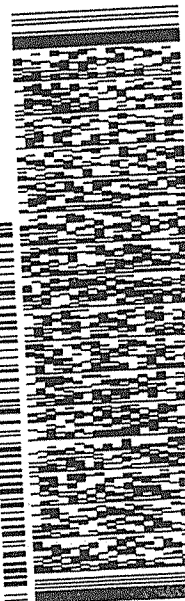
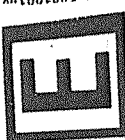
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PDDASRAE20DF6X0A

FedEx
Express



TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

1 of 3

TRK# 5908 1782 1937

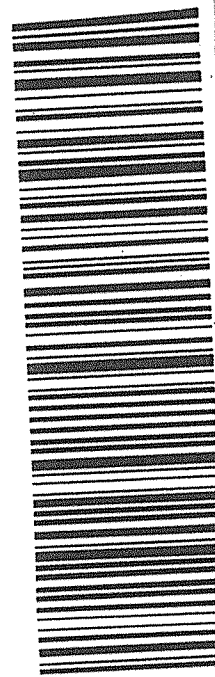
0201

MASTER

X7 RBWA

29407

SC-US CHS



Part # 156148V-434 HIT2 06/15

ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
1A00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

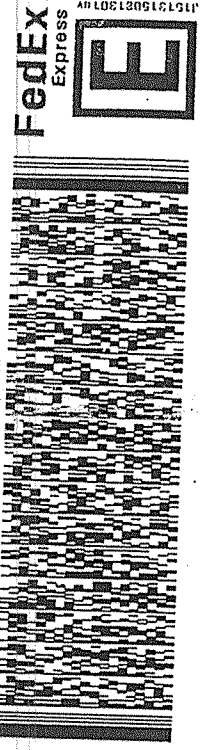
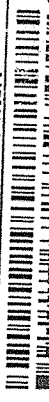
SHIP DATE: 12 JUN 17
ACTWGT: 51.0 LB MAN
CAD: 0014178/CAFE2916
BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171

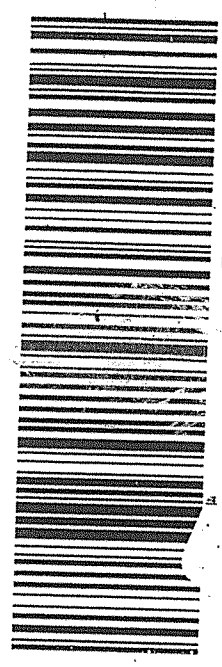
REF: 21PD0ASRAE20DF6X0A



3 of 3
MPS# 5908 1782 1959
Mstr# 5908 1782 1937
TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US
CHS



RT0
FZ0

1959
C613

ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
1A00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

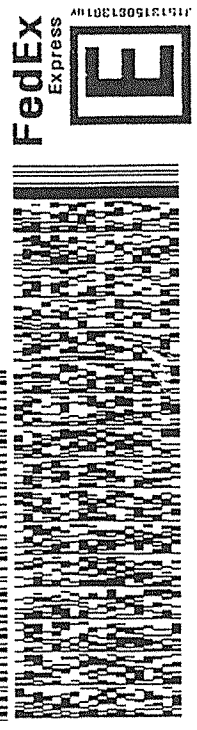
SHIP DATE: 12 JUN 17
ACTWGT: 52.0 LB MAN
CAD: 0014178/CAFE2916
BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171

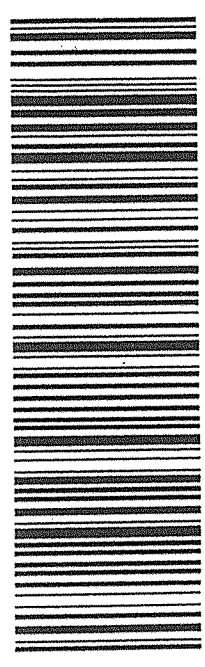
REF: 21PD0ASRGW04BAGWE0



1 of 2
MPS# 5908 1782 1960
Mstr# 5908 1782 1937
TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US
CHS



SHIP DATE: 12 JUN 17
ACTWGT: 53.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

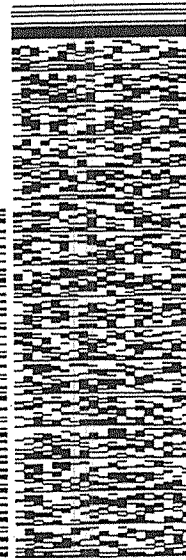
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB
30 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

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

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRAE20DF6X0A

FedEx
Express

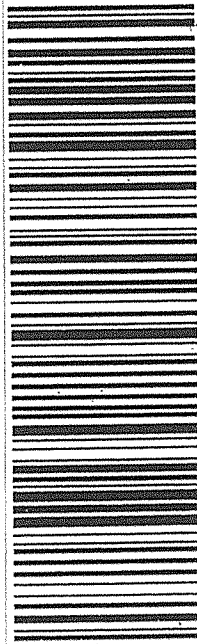


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

2 of 3
5908 1782 1948
str# 5908 1782 1937

X7 RBWA

29407
SC-US CHS



1948
06.13

R70
FZ 0

SHIP DATE: 12 JUN 17
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2916

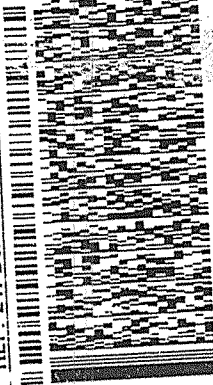
BILL SENDER

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

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

CHARLESTON SC 29407

(843) 556-8171
REF: 21PD0ASRGW04BAGWEO

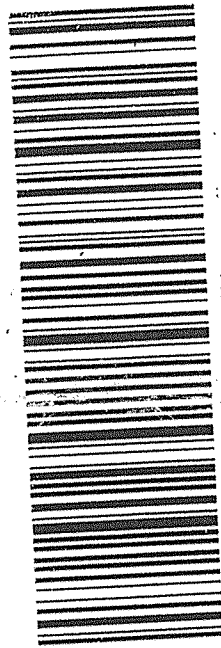


TUE - 13 JUN 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1782 2017
0201

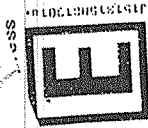
X7 RBWA

29407
SC-US CHS



Part # 156140V-434 RTT2 06/15

538C1/A502/329B
5 10:30 2017
06.13



RT 257
ST F2

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 #: 2017-1716
Work Order #: 425329**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1676097

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
425329001	CAWA-17-133302
425329004	CAWA-17-133340
425329005	CAWA-17-133345
1203816298	Method Blank (MB)
1203816299	Laboratory Control Sample (LCS)
1203816300	Laboratory Control Sample (LCS)
1203816301	425329001(CAWA-17-133302) Post Spike (PS)
1203816302	425329001(CAWA-17-133302) Post Spike (PS)
1203816303	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)
1203816304	425329001(CAWA-17-133302) Post Spike Duplicate (PSD)

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 blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 425329001 (CAWA-17-133302) 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 RPD between the matrix spike pair (See Below) were not all within the acceptance limits. However, the spike recoveries passed. The unacceptable RPD may be attributed to matrix interference and/or sample non-homogeneity.

Sample	Analyte	Value
1203816301PS and 1203816303PSD (CAWA-17-133302)	Chloromethane	33* (0%-20%)
	Vinyl chloride	34* (0%-20%)

Internal Standard (ISTD) Acceptance

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

Technical Information**Holding Time Specifications**

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

Electronic Package Comment

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

The Qualifiers in this report are defined as follows:

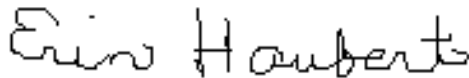
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.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

Review/Validation

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

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

Signature:



Name: Erin Haubert

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	425329001	Date Received:	06/13/2017 09:10		
Client Sample:	VOA/SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-133302	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 15:56	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 15:56				
Data File:	062117V4\4N315.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	425329001	Date Received:	06/13/2017 09:10		
Client Sample:	VOA/SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-133302	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 15:56	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 15:56				
Data File:	062117V4\4N315.D	Column:	DB-624		

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	425329001	Date Received:	06/13/2017 09:10		
Client Sample:	VOA/SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAWA-17-133302	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 15:56	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 15:56				
Data File:	062117V4\4N315.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	ug/L 96	(71%-134%)
Bromofluorobenzene	48.4	50.0	ug/L 97	(70%-131%)
Toluene-d8	48.4	50.0	ug/L 97	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	10	ug/L	0	J
	unknown siloxane	14.576	20.2	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1676097

Run Date: 06/21/2017 16:25

Prep Date: 06/21/2017 16:25

Data File: 062117V4\4N316.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.8	50.0	ug/L 96	(71%-134%)
Bromofluorobenzene	47.1	50.0	ug/L 94	(70%-131%)
Toluene-d8	48.2	50.0	ug/L 96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	6.98	ug/L	0	J
	unknown siloxane	14.576	9.37	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329005

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133345

Batch ID: 1676097

Run Date: 06/21/2017 16:54

Prep Date: 06/21/2017 16:54

Data File: 062117V4\4N317.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 425329005

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133345

Batch ID: 1676097

Run Date: 06/21/2017 16:54

Prep Date: 06/21/2017 16:54

Data File: 062117V4\4N317.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716
Lab Sample ID: 425329005

Client ID: CAWA-17-133345
Batch ID: 1676097
Run Date: 06/21/2017 16:54
Prep Date: 06/21/2017 16:54
Data File: 062117V4\4N317.D

Date Collected: 06/08/2017 11:53
Date Received: 06/13/2017 09:10
Client: ARSL004
Method: SW-846:8260B
Inst: VOA4.I
Analyst: VXY1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	97	(71%-134%)
Bromofluorobenzene	50.5	50.0	101	(70%-131%)
Toluene-d8	48.0	50.0	96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	14.1	ug/L	0	J
	unknown siloxane	14.576	34.4	ug/L	0	J
	unknown siloxane	16.533	7.01	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1716**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203816299	LCS for batch 1676097	89	96	88
1203816300	LCS for batch 1676097	93	95	98
1203816298	MB for batch 1676097	91	98	89
425329001	CAWA-17-133302	96	97	97
425329004	CAWA-17-133340	96	96	94
425329005	CAWA-17-133345	97	96	101
1203816301	CAWA-17-133302PS	99	97	93
1203816303	CAWA-17-133302PSD	99	98	95
1203816302	CAWA-17-133302PS	97	97	101
1203816304	CAWA-17-133302PSD	102	97	101

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: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	96.3	96	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1140	91	61-125
67-64-1	LCS Acetone	250	0.0	298	119	48-157
74-88-4	LCS Iodomethane	250	0.0	244	98	72-128
75-15-0	LCS Carbon disulfide	250	0.0	234	94	69-138
108-05-4	LCS Vinyl acetate	250	0.0	213	85	67-125
78-93-3	LCS 2-Butanone	250	0.0	260	104	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	223	89	66-124
591-78-6	LCS 2-Hexanone	250	0.0	264	106	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	30.0	60	40-160
74-87-3	LCS Chloromethane	50.0	0.0	41.8	84	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	41.8	84	65-137
74-83-9	LCS Bromomethane	50.0	0.0	42.2	84	63-137
75-00-3	LCS Chloroethane	50.0	0.0	44.5	89	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	42.4	85	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	48.7	97	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	47.1	94	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	44.2	88	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	46.1	92	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	48.6	97	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	47.8	96	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	49.9	100	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	46.4	93	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	51.4	103	76-125
67-66-3	LCS Chloroform	50.0	0.0	45.4	91	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.5	93	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	45.5	91	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	49.3	99	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	45.4	91	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	48.2	96	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	46.9	94	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	47.7	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	48.4	97	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
108-88-3	LCS Toluene	50.0	0.0	44.6	89	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	48.2	96	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	46.2	92	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	44.3	89	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	47.7	95	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	45.7	91	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	47.5	95	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	46.9	94	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	45.5	91	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	46.6	93	74-126
100-42-5	LCS Styrene	50.0	0.0	51.3	103	72-130
75-25-2	LCS Bromoform	50.0	0.0	52.8	106	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	45.2	90	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	42.4	85	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	43.7	87	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	46.3	93	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	43.7	87	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.6	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	45.9	92	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	42.5	85	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	47.7	95	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	45.9	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.5	93	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.9	96	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	45.1	90	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	44.3	89	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	44.5	89	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	42.6	85	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	48.0	96	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	47.1	94	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816299

Instrument: VOA4.I

Analysis Date: 06/21/2017 10:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	44.6	89	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	50.9	102	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	45.6	91	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5040	101	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1676097

Matrix: WATER

Lab Sample ID 1203816300

Instrument: VOA4.I

Analysis Date: 06/21/2017 11:05

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	282	113	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	223	89	61-148
107-05-1	LCS Allyl chloride	250	0.0	237	95	59-125
107-13-1	LCS Acrylonitrile	250	0.0	222	89	65-122
107-12-0	LCS Propionitrile	250	0.0	216	86	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	229	91	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	228	91	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	218	87	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2140	86	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	36.7	73	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	99.5	100	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1350	108	56-131
67-64-1	PS Acetone	250	0.00 U	157	63	25-155
74-88-4	PS Iodomethane	250	0.00 U	264	105	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	248	99	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	211	85	48-133
78-93-3	PS 2-Butanone	250	0.00 U	204	81	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	263	105	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	228	91	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	31.9	64	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	40.3	81	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	44.3	89	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.4	87	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	44.7	89	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	43.2	86	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	50.5	101	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	50.4	101	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.7	97	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	53.8	108	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	52.6	105	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.5	107	69-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	50.3	101	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	56.3	113	71-130
67-66-3	PS Chloroform	50.0	0.00 U	50.7	101	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	50.8	102	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	49.1	98	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	52.6	105	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	52.6	105	69-130
71-43-2	PS Benzene	50.0	0.00 U	49.2	98	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	51.7	103	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	51.4	103	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	53.3	107	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	52.7	105	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	52.7	105	70-134
108-88-3	PS Toluene	50.0	0.00 U	47.1	94	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	53.7	107	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	51.1	102	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	49.5	99	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	48.7	97	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	48.7	97	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	52.6	105	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	49.4	99	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	48.1	96	61-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	49.4	99	62-131
100-42-5	PS Styrene	50.0	0.00 U	52.8	106	59-135
75-25-2	PS Bromoform	50.0	0.00 U	56.4	113	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	47.3	95	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.2	98	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	50.7	101	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.8	98	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	45.4	91	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	50.0	100	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	48.6	97	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	44.4	89	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	50.9	102	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	48.2	96	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	48.8	98	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	50.2	100	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.7	93	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	45.5	91	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	46.4	93	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.0	104	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	47.9	96	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	56.5	113	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	50.3	101	52-135

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816301

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	47.8	96	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	54.3	109	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	48.2	96	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	6270	125	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	97.6	98	59-132	2	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1370	109	56-131	1	0-20
67-64-1	PSD Acetone	250	0.00 U	153	61	25-155	3	0-20
74-88-4	PSD Iodomethane	250	0.00 U	269	108	66-133	2	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	242	97	61-141	3	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	200	80	48-133	6	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	199	80	25-143	2	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	256	102	61-127	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	214	86	33-138	6	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	32.1	64	33-164	1	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	29.0	58	53-139	33 *	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	31.4	63	58-140	34 *	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	42.1	84	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	45.1	90	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	44.2	88	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.7	101	69-127	1	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	51.5	103	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	48.9	98	62-123	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	55.2	110	69-132	3	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	52.7	105	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	52.3	105	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	53.9	108	69-127	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	52.2	104	66-137	4	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	57.0	114	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	51.4	103	71-129	1	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	52.8	106	69-139	4	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	49.9	100	67-130	2	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	55.8	112	66-143	6	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	52.3	105	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00 U	49.5	99	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	52.1	104	65-131	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	50.7	101	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	53.9	108	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	53.9	108	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	53.2	106	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00 U	47.7	95	60-126	1	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	54.1	108	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	51.3	103	66-125	0	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	48.2	96	67-124	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	51.4	103	60-130	5	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	51.2	102	68-143	5	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	54.8	110	71-127	4	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	49.6	99	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	47.6	95	61-130	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	48.2	96	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	51.5	103	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	59.4	119	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	47.3	95	55-133	0	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.6	97	62-129	1	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	50.5	101	70-124	0	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	49.3	99	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	43.7	87	50-133	4	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	47.1	94	53-135	6	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	45.6	91	56-128	6	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	44.6	89	53-130	1	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	50.6	101	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	47.5	95	53-132	2	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	47.0	94	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	48.7	97	49-138	3	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.8	94	56-126	0	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	45.8	92	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	43.7	87	43-142	6	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	52.5	105	62-141	1	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	47.7	95	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	55.1	110	62-134	2	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	50.7	101	52-135	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816303

Instrument: VOA4.I

Analysis Date: 06/21/2017 19:49

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	48.5	97	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	55.2	110	71-133	2	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	48.3	97	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	6160	123	60-140	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1716

Sample Type: Post Spike

Client ID: CAWA-17-133302PS

Matrix: W

Lab Sample ID 1203816302

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:18

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	262	105	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	209	84	57-149
107-05-1	PS Allyl chloride	250	0.00 U	227	91	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	218	87	59-129
107-12-0	PS Propionitrile	250	0.00 U	215	86	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	222	89	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	225	90	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	216	86	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2120	85	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	37.0	74	63-146

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1716

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133302PSD

Matrix: W

Lab Sample ID 1203816304

Instrument: VOA4.I

Analysis Date: 06/21/2017 20:47

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1676097

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	280	112	49-141	7	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	U	231	92	57-149	10	0-20
107-05-1	PSD Allyl chloride	250	0.00	U	244	97	54-128	7	0-20
107-13-1	PSD Acrylonitrile	250	0.00	U	236	94	59-129	8	0-20
107-12-0	PSD Propionitrile	250	0.00	U	228	91	58-131	6	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	U	241	96	59-134	8	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	U	241	96	62-135	7	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	U	231	92	60-136	7	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	U	2250	90	60-143	6	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	U	39.6	79	63-146	7	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2017-1716	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1676097	Instrument ID:	VOA4.I	Data File:	062117V4\4N306A.D
Lab Sample ID:	1203816298	Prep Date:	06/21/2017 11:34	Analyzed:	06/21/17 11:34
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 1676097	1203816299	062117V4\4N303A.D	06/21/17	1007
02 LCS for batch 1676097	1203816300	062117V4\4N305A.D	06/21/17	1105
03 CAWA-17-133302	425329001	062117V4\4N315.D	06/21/17	1556
04 CAWA-17-133340	425329004	062117V4\4N316.D	06/21/17	1625
05 CAWA-17-133345	425329005	062117V4\4N317.D	06/21/17	1654
06 CAWA-17-133302PS	1203816301	062117V4\4N322.D	06/21/17	1920
07 CAWA-17-133302PSD	1203816303	062117V4\4N323.D	06/21/17	1949
08 CAWA-17-133302PS	1203816302	062117V4\4N324.D	06/21/17	2018
09 CAWA-17-133302PSD	1203816304	062117V4\4N325.D	06/21/17	2047

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716

Lab Sample ID: 1203816298

Client Sample: QC for batch 1676097

Client ID: MB for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:34

Prep Date: 06/21/2017 11:34

Data File: 062117V4\4N306A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816298		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	MB for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 11:34	Analyst:	VXY1
Prep Date:	06/21/2017 11:34		
Data File:	062117V4\4N306A.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.3	50.0	91	(71%-134%)
Bromofluorobenzene	44.7	50.0	89	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 10:07

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		50.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		42.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		46.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		47.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		47.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		45.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		47.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		43.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.6	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		45.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		42.6	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.5	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		44.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		44.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		46.4	ug/L	0.300	1.00
78-93-3	2-Butanone		260	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		45.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		264	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		42.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		223	ug/L	1.50	5.00
67-64-1	Acetone		298	ug/L	1.50	10.0
75-05-8	Acetonitrile		1140	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		51.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		48.4	ug/L	0.300	1.00
75-25-2	Bromoform		52.8	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816299

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 10:07

Prep Date: 06/21/2017 10:07

Data File: 062117V4\4N303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		234	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.9	ug/L	0.300	1.00
75-00-3	Chloroethane		44.5	ug/L	0.300	1.00
67-66-3	Chloroform		45.4	ug/L	0.300	1.00
74-87-3	Chloromethane		41.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		45.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		30.0	ug/L	0.300	1.00
60-29-7	Ethyl ether		48.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		45.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		244	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		45.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		44.2	ug/L	1.00	10.0
91-20-3	Naphthalene		48.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.7	ug/L	0.300	1.00
108-88-3	Toluene		44.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.2	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		42.4	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		213	ug/L	1.50	5.00
75-01-4	Vinyl chloride		41.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		96.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5040	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		46.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.5	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816299		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	LCS for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 10:07	Analyst:	VXY1
Prep Date:	06/21/2017 10:07		
Data File:	062117V4\4N303A.D	Column:	DB-624
		Project:	QC
		SOP Ref:	GL-OA-E-038
		Dilution:	1
		Purge Vol:	5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		46.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		48.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		48.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.7	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	44.2	50.0	ug/L 88	(70%-131%)
Toluene-d8	48.2	50.0	ug/L 96	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client ID: LCS for batch 1676097

Batch ID: 1676097

Run Date: 06/21/2017 11:05

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		36.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		282	ug/L	1.50	5.00
107-13-1	Acrylonitrile		222	ug/L	1.50	5.00
107-05-1	Allyl chloride		237	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716

Matrix: WATER

Lab Sample ID: 1203816300

Client Sample: QC for batch 1676097

Client: ARSL004

Project: QC

Client ID: LCS for batch 1676097

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1676097

Inst: VOA4.I

Dilution: 1

Run Date: 06/21/2017 11:05

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/21/2017 11:05

Data File: 062117V4\4N305A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		218	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2140	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		229	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		228	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		216	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		223	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Matrix:	WATER
Lab Sample ID:	1203816300		
Client Sample:	QC for batch 1676097	Client:	ARSL004
Client ID:	LCS for batch 1676097	Method:	SW-846:8260B
Batch ID:	1676097	Inst:	VOA4.I
Run Date:	06/21/2017 11:05	Analyst:	VXY1
Prep Date:	06/21/2017 11:05		
Data File:	062117V4\4N305A.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.4	50.0	93	(71%-134%)
Bromofluorobenzene	48.9	50.0	98	(70%-131%)
Toluene-d8	47.7	50.0	95	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816301	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:20	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:20				
Data File:	062117V4\4N322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		54.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		50.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.3	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		47.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.6	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.7	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		50.3	ug/L	0.300	1.00
78-93-3	2-Butanone		204	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		48.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		228	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		263	ug/L	1.50	5.00
67-64-1	Acetone		157	ug/L	1.50	10.0
75-05-8	Acetonitrile		1350	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		56.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.7	ug/L	0.300	1.00
75-25-2	Bromoform		56.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816301	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:20		
Data File: 062117V4\4N322.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		248	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.4	ug/L	0.300	1.00
75-00-3	Chloroethane		44.7	ug/L	0.300	1.00
67-66-3	Chloroform		50.7	ug/L	0.300	1.00
74-87-3	Chloromethane		40.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		48.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		31.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.9	ug/L	0.300	1.00
74-88-4	Iodomethane		264	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.7	ug/L	1.00	10.0
91-20-3	Naphthalene		56.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		52.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.7	ug/L	0.300	1.00
108-88-3	Toluene		47.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		43.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		211	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.5	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		52.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		99.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6270	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.4	ug/L	0.300	1.00
95-47-6	o-Xylene		49.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.8	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816301	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:20	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:20				
Data File:	062117V4\4N322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.3	50.0	99	(71%-134%)
Bromofluorobenzene	46.7	50.0	93	(70%-131%)
Toluene-d8	48.4	50.0	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816302	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:18	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:18		
Data File: 062117V4\4N324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		262	ug/L	1.50	5.00
107-13-1	Acrylonitrile		218	ug/L	1.50	5.00
107-05-1	Allyl chloride		227	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		216	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2120	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	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	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		215	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		209	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816302	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:18	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:18				
Data File:	062117V4\4N324.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.7	50.0	97	(71%-134%)
Bromofluorobenzene	50.4	50.0	101	(70%-131%)
Toluene-d8	48.5	50.0	97	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816303	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 19:49	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 19:49		
Data File: 062117V4\4N323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		55.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		51.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		48.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		52.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		47.1	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		48.2	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.2	ug/L	0.300	1.00
78-93-3	2-Butanone		199	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		45.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		214	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		256	ug/L	1.50	5.00
67-64-1	Acetone		153	ug/L	1.50	10.0
75-05-8	Acetonitrile		1370	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		49.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		57.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.9	ug/L	0.300	1.00
75-25-2	Bromoform		59.4	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816303	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:49	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:49				
Data File:	062117V4\4N323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		242	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.6	ug/L	0.300	1.00
75-00-3	Chloroethane		45.1	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		29.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		51.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		32.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.7	ug/L	0.300	1.00
74-88-4	Iodomethane		269	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.9	ug/L	1.00	10.0
91-20-3	Naphthalene		55.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.4	ug/L	0.300	1.00
108-88-3	Toluene		47.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		44.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		200	ug/L	1.50	5.00
75-01-4	Vinyl chloride		31.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		97.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6160	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		43.7	ug/L	0.300	1.00
95-47-6	o-Xylene		48.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.0	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816303	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 19:49	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 19:49				
Data File:	062117V4\4N323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		55.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.6	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		54.1	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.5	50.0	99	(71%-134%)
Bromofluorobenzene	47.6	50.0	95	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816304	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:47	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:47				
Data File:	062117V4\4N325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		39.6	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		280	ug/L	1.50	5.00
107-13-1	Acrylonitrile		236	ug/L	1.50	5.00
107-05-1	Allyl chloride		244	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-1716	Date Collected:	06/08/2017 11:53	Matrix:	W
Lab Sample ID:	1203816304	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1676097	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-133302PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1676097	Inst:	VOA4.I	Dilution:	1
Run Date:	06/21/2017 20:47	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	06/21/2017 20:47				
Data File:	062117V4\4N325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		231	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2250	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		241	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		241	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		228	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		231	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 1203816304	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1676097	Client: ARSL004	Project: QC
Client ID: CAWA-17-133302PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1676097	Inst: VOA4.I	Dilution: 1
Run Date: 06/21/2017 20:47	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 06/21/2017 20:47		
Data File: 062117V4\4N325.D	Column: DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L 101	(70%-131%)
Toluene-d8	48.7	50.0	ug/L 97	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

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:	1673585
Prep Batch Number:	1673582

Sample Analysis

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

Sample ID	Client ID
425329001	CAWA-17-133302
425329004	CAWA-17-133340
1203810346	Method Blank (MB)
1203810347	Laboratory Control Sample (LCS)
1203810348	425316004(MD50-17-138988) Matrix Spike (MS)
1203810349	425316004(MD50-17-138988) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-009 REV# 39.

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

Calibration Information

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

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

Initial Calibration

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

CCV Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 425316004 (MD50-17-138988) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

The 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**

Sample 1203810347 (LCS) required manual integration in order to properly identify one or more peaks and/or to correctly position the baseline as set in the calibration standard injections.

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 425329001 (CAWA-17-133302) and 425329004 (CAWA-17-133340) 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
MSD1.I	Agilent 6890N/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Polysilarylene-95% Polydimethylsiloxane)

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

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: 10 JUL 2017

Title: Data Validator

Sample Data Summary

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

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 14:19	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 950 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1413.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.5	ug/L	3.16	10.5
120-82-1	1,2,4-Trichlorobenzene	U	10.5	ug/L	3.16	10.5
95-50-1	1,2-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
122-66-7	Azobenzene	U	10.5	ug/L	3.16	10.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
106-46-7	1,4-Dichlorobenzene	U	10.5	ug/L	3.16	10.5
123-91-1	1,4-Dioxane	U	10.5	ug/L	3.16	10.5
90-12-0	1-Methylnaphthalene	U	1.05	ug/L	0.316	1.05
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.5	ug/L	3.16	10.5
95-95-4	2,4,5-Trichlorophenol	U	10.5	ug/L	3.16	10.5
88-06-2	2,4,6-Trichlorophenol	U	10.5	ug/L	3.16	10.5
120-83-2	2,4-Dichlorophenol	U	10.5	ug/L	3.16	10.5
105-67-9	2,4-Dimethylphenol	U	10.5	ug/L	3.16	10.5
51-28-5	2,4-Dinitrophenol	U	21.1	ug/L	5.26	21.1
121-14-2	2,4-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
606-20-2	2,6-Dinitrotoluene	U	10.5	ug/L	3.16	10.5
91-58-7	2-Chloronaphthalene	U	1.05	ug/L	0.432	1.05
95-57-8	2-Chlorophenol	U	10.5	ug/L	3.16	10.5
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.5	ug/L	3.16	10.5
91-57-6	2-Methylnaphthalene	U	1.05	ug/L	0.316	1.05
88-75-5	2-Nitrophenol	U	10.5	ug/L	3.16	10.5
91-94-1	3,3'-Dichlorobenzidine	U	10.5	ug/L	3.16	10.5
101-55-3	4-Bromophenylphenylether	U	10.5	ug/L	3.16	10.5
59-50-7	Parachlorometa cresol	U	10.5	ug/L	3.16	10.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.5	ug/L	3.47	10.5
7005-72-3	4-Chlorophenylphenylether	U	10.5	ug/L	3.16	10.5
100-02-7	4-Nitrophenol	U	10.5	ug/L	3.16	10.5
83-32-9	Acenaphthene	U	1.05	ug/L	0.316	1.05
208-96-8	Acenaphthylene	U	1.05	ug/L	0.316	1.05
62-53-3	Aniline	U	10.5	ug/L	4.42	10.5
120-12-7	Anthracene	U	1.05	ug/L	0.316	1.05
1912-24-9	Atrazine	U	10.5	ug/L	3.16	10.5
92-87-5	Benzidine	U	10.5	ug/L	4.11	10.5
56-55-3	Benzo(a)anthracene	U	1.05	ug/L	0.316	1.05
50-32-8	Benzo(a)pyrene	U	1.05	ug/L	0.316	1.05
205-99-2	Benzo(b)fluoranthene	U	1.05	ug/L	0.316	1.05
191-24-2	Benzo(ghi)perylene	U	1.05	ug/L	0.316	1.05

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

Page 2 of 3

SDG Number: 2017-1716	Date Collected: 06/08/2017 11:53	Matrix: W
Lab Sample ID: 425329001	Date Received: 06/13/2017 09:10	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-133302	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 14:19	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 950 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1413.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.05	ug/L	0.316	1.05
65-85-0	Benzoic acid	U	21.1	ug/L	6.32	21.1
100-51-6	Benzyl alcohol	U	10.5	ug/L	3.16	10.5
85-68-7	Butylbenzylphthalate	U	10.5	ug/L	3.16	10.5
218-01-9	Chrysene	U	1.05	ug/L	0.316	1.05
84-74-2	Di-n-butylphthalate	U	10.5	ug/L	3.16	10.5
117-84-0	Di-n-octylphthalate	U	10.5	ug/L	3.16	10.5
53-70-3	Dibenzo(a,h)anthracene	U	1.05	ug/L	0.316	1.05
132-64-9	Dibenzofuran	U	10.5	ug/L	3.16	10.5
84-66-2	Diethylphthalate	U	10.5	ug/L	3.16	10.5
131-11-3	Dimethylphthalate	U	10.5	ug/L	3.16	10.5
88-85-7	Dinoseb	U	10.5	ug/L	3.16	10.5
122-39-4	Diphenylamine	U	10.5	ug/L	3.16	10.5
206-44-0	Fluoranthene	U	1.05	ug/L	0.316	1.05
86-73-7	Fluorene	U	1.05	ug/L	0.316	1.05
118-74-1	Hexachlorobenzene	U	10.5	ug/L	3.16	10.5
87-68-3	Hexachlorobutadiene	U	10.5	ug/L	3.16	10.5
77-47-4	Hexachlorocyclopentadiene	U	10.5	ug/L	3.16	10.5
67-72-1	Hexachloroethane	U	10.5	ug/L	3.16	10.5
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.05	ug/L	0.316	1.05
78-59-1	Isophorone	U	10.5	ug/L	3.68	10.5
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.5	ug/L	3.16	10.5
924-16-3	N-Nitrosodi-n-butylamine	U	10.5	ug/L	3.16	10.5
55-18-5	N-Nitrosodiethylamine	U	10.5	ug/L	3.16	10.5
621-64-7	N-Nitrosodi--n-propylamine	U	10.5	ug/L	3.16	10.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.5	ug/L	3.16	10.5
91-20-3	Naphthalene	U	1.05	ug/L	0.316	1.05
98-95-3	Nitrobenzene	U	10.5	ug/L	3.16	10.5
608-93-5	Pentachlorobenzene	U	10.5	ug/L	3.16	10.5
87-86-5	Pentachlorophenol	U	10.5	ug/L	3.16	10.5
85-01-8	Phenanthrene	U	1.05	ug/L	0.316	1.05
108-95-2	Phenol	U	10.5	ug/L	3.16	10.5
129-00-0	Pyrene	U	1.05	ug/L	0.316	1.05
110-86-1	Pyridine	U	10.5	ug/L	3.16	10.5
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.5	ug/L	3.16	10.5
111-91-1	bis(2-Chloroethoxy)methane	U	10.5	ug/L	3.16	10.5
111-44-4	bis(2-Chloroethyl) ether	U	10.5	ug/L	3.16	10.5
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.5	ug/L	3.16	10.5

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

Page 3 of 3

SDG Number: 2017-1716
Lab Sample ID: 425329001
Client Sample: VOA/SVOA
Client ID: CAWA-17-133302
Batch ID: 1673585
Run Date: 06/14/2017 14:19
Prep Date: 06/13/2017 17:55
Data File: s061417.B\s1f1413.D

Date Collected: 06/08/2017 11:53
Date Received: 06/13/2017 09:10
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JMB3
Aliquot: 950 mL
Column: 25x.20x.33

Matrix: W
Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	10.5	ug/L	3.89	10.5
99-09-2	3-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.5	ug/L	3.16	10.5
88-74-4	2-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.5	ug/L	3.16	10.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.2	105	ug/L	57	(32%-124%)
2-Fluorobiphenyl	30.6	52.6	ug/L	58	(32%-112%)
2-Fluorophenol	35.3	105	ug/L	33	(15%-88%)
Nitrobenzene-d5	28.2	52.6	ug/L	54	(36%-115%)
Phenol-d5	21.2	105	ug/L	20	(15%-91%)
p-Terphenyl-d14	39.8	52.6	ug/L	76	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	17.396	7.53	ug/L	0	J

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

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1673585

Inst: MSD1.I

Dilution: 1

Run Date: 06/14/2017 14:50

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1414.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.2	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	10.2	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
122-66-7	Azobenzene	U	10.2	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	U	10.2	ug/L	3.06	10.2
90-12-0	1-Methylnaphthalene	U	1.02	ug/L	0.306	1.02
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.2	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	10.2	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	10.2	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	10.2	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	10.2	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	20.4	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	1.02	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	10.2	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.2	ug/L	3.06	10.2
91-57-6	2-Methylnaphthalene	U	1.02	ug/L	0.306	1.02
88-75-5	2-Nitrophenol	U	10.2	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	10.2	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	10.2	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	10.2	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.2	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	10.2	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	10.2	ug/L	3.06	10.2
83-32-9	Acenaphthene	U	1.02	ug/L	0.306	1.02
208-96-8	Acenaphthylene	U	1.02	ug/L	0.306	1.02
62-53-3	Aniline	U	10.2	ug/L	4.29	10.2
120-12-7	Anthracene	U	1.02	ug/L	0.306	1.02
1912-24-9	Atrazine	U	10.2	ug/L	3.06	10.2
92-87-5	Benzidine	U	10.2	ug/L	3.98	10.2
56-55-3	Benzo(a)anthracene	U	1.02	ug/L	0.306	1.02
50-32-8	Benzo(a)pyrene	U	1.02	ug/L	0.306	1.02
205-99-2	Benzo(b)fluoranthene	U	1.02	ug/L	0.306	1.02
191-24-2	Benzo(ghi)perylene	U	1.02	ug/L	0.306	1.02

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

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD1.I

Dilution: 1

Batch ID: 1673585

Run Date: 06/14/2017 14:50

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1414.D

Column: 25x.20x.33

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	1.02	ug/L	0.306	1.02
65-85-0	Benzoic acid	U	20.4	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	10.2	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	10.2	ug/L	3.06	10.2
218-01-9	Chrysene	U	1.02	ug/L	0.306	1.02
84-74-2	Di-n-butylphthalate	U	10.2	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	10.2	ug/L	3.06	10.2
53-70-3	Dibenzo(a,h)anthracene	U	1.02	ug/L	0.306	1.02
132-64-9	Dibenzofuran	U	10.2	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	10.2	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	10.2	ug/L	3.06	10.2
88-85-7	Dinoseb	U	10.2	ug/L	3.06	10.2
122-39-4	Diphenylamine	U	10.2	ug/L	3.06	10.2
206-44-0	Fluoranthene	U	1.02	ug/L	0.306	1.02
86-73-7	Fluorene	U	1.02	ug/L	0.306	1.02
118-74-1	Hexachlorobenzene	U	10.2	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	10.2	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	10.2	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	10.2	ug/L	3.06	10.2
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.02	ug/L	0.306	1.02
78-59-1	Isophorone	U	10.2	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.2	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	10.2	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	10.2	ug/L	3.06	10.2
621-64-7	N-Nitrosodi--n-propylamine	U	10.2	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.2	ug/L	3.06	10.2
91-20-3	Naphthalene	U	1.02	ug/L	0.306	1.02
98-95-3	Nitrobenzene	U	10.2	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	10.2	ug/L	3.06	10.2
87-86-5	Pentachlorophenol	U	10.2	ug/L	3.06	10.2
85-01-8	Phenanthrene	U	1.02	ug/L	0.306	1.02
108-95-2	Phenol	U	10.2	ug/L	3.06	10.2
129-00-0	Pyrene	U	1.02	ug/L	0.306	1.02
110-86-1	Pyridine	U	10.2	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.2	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	10.2	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	10.2	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.2	ug/L	3.06	10.2

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

Page 3 of 3

SDG Number: 2017-1716

Lab Sample ID: 425329004

Date Collected: 06/08/2017 11:53

Date Received: 06/13/2017 09:10

Matrix: W

Client ID: CAWA-17-133340

Batch ID: 1673585

Run Date: 06/14/2017 14:50

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1414.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 980 mL

Column: 25x.20x.33

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	10.2	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.2	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	61.6	102	ug/L	60	(32%-124%)
2-Fluorobiphenyl	30.1	51.0	ug/L	59	(32%-112%)
2-Fluorophenol	35.2	102	ug/L	34	(15%-88%)
Nitrobenzene-d5	27.6	51.0	ug/L	54	(36%-115%)
Phenol-d5	21.1	102	ug/L	21	(15%-91%)
p-Terphenyl-d14	38.3	51.0	ug/L	75	(36%-121%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1716

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203810346	MB for batch 1673582	34	21	68	74	60	87
1203810347	LCS for batch 1673582	44	25	79	79	81	88
1203810348	MD50-17-138988MS	48	35	62	63	70	77
1203810349	MD50-17-138988MSD	47	35	59	61	74	76
425329001	CAWA-17-133302	33	20	54	58	57	76
425329004	CAWA-17-133340	34	21	54	59	60	75

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: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID:1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	21.5	43	30-88
110-86-1	LCS Pyridine	50.0	0.0	22.1	44	27-89
62-53-3	LCS Aniline	50.0	0.0	38.5	77	49-112
108-95-2	LCS Phenol	50.0	0.0	13.8	28	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	35.4	71	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	35.6	71	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	31.2	62	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	30.9	62	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	31.9	64	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	38.9	78	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	30.8	62	44-102
95-48-7	LCS o-Cresol	50.0	0.0	30.7	61	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	29.4	59	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	34.7	69	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	31.0	62	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	38.7	77	53-115
78-59-1	LCS Isophorone	50.0	0.0	39.2	78	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	38.7	77	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	35.2	70	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	38.2	76	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.4	81	53-109
65-85-0	LCS Benzoic acid	100	0.0	23.8	24	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	48.7	97	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	34.5	69	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	41.8	84	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	36.7	73	42-103
91-20-3	LCS Naphthalene	50.0	0.0	35.9	72	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	36.4	73	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	19.8	40	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	41.2	82	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	38.4	77	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	33.7	67	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	39.8	80	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.4	95	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	44.7	89	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	44.1	88	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	43.9	88	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	38.7	77	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	41.1	82	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	34.6	69	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	39.3	79	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	41.7	83	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	45.1	90	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	13.3	27	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	42.0	84	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	43.5	87	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	40.2	80	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	38.3	77	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	37.7	75	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	38.2	76	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	41.7	83	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	41.9	84	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	32.9	66	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.8	80	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.4	79	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	42.0	84	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	40.0	80	54-118
129-00-0	LCS Pyrene	50.0	0.0	42.9	86	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	45.5	91	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	45.6	91	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	44.7	89	57-112
218-01-9	LCS Chrysene	50.0	0.0	43.9	88	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	45.3	91	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	44.7	89	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	43.8	88	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	44.4	89	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1716

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1673582

Matrix: WATER

Lab Sample ID 1203810347

Instrument: MSD1.I

Analysis Date: 06/14/2017 12:17

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	46.4	93	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	45.9	92	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	43.8	88	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	24.9	50	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	36.2	72	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	37.8	76	44-102
1912-24-9	LCS Atrazine	50.0	0.0	47.8	96	60-131
92-87-5	LCS Benzidine	100	0.0	51.7	52	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	43.7	87	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	34.5	69	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID:1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	106	0.00 U	50.8	48	25-106
110-86-1	MS Pyridine	106	0.00 U	51.3	48	24-93
62-53-3	MS Aniline	106	0.00 U	67.9	64	37-113
108-95-2	MS Phenol	106	0.00 U	39.6	37	23-82
111-44-4	MS bis(2-Chloroethyl) ether	106	0.00 U	58.1	55	39-114
95-57-8	MS 2-Chlorophenol	106	0.00 U	62.2	58	37-108
541-73-1	MS 1,3-Dichlorobenzene	106	0.00 U	52.4	49	27-97
106-46-7	MS 1,4-Dichlorobenzene	106	0.00 U	52.9	50	28-97
95-50-1	MS 1,2-Dichlorobenzene	106	0.00 U	55.1	52	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	106	0.00 U	66.4	62	32-127
100-51-6	MS Benzyl alcohol	106	0.00 U	60.1	57	37-116
95-48-7	MS o-Cresol	106	0.00 U	61.3	58	34-109
65794-96-9	MS m,p-Cresols	106	0.00 U	61.8	58	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	106	0.00 U	61.0	57	42-118
67-72-1	MS Hexachloroethane	106	0.00 U	51.4	48	29-94
98-95-3	MS Nitrobenzene	106	0.00 U	64.9	61	38-123
78-59-1	MS Isophorone	106	0.00 U	66.9	63	43-120
88-75-5	MS 2-Nitrophenol	106	0.00 U	69.1	65	39-115
105-67-9	MS 2,4-Dimethylphenol	106	0.00 U	63.0	59	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	106	0.00 U	64.2	60	42-118
120-83-2	MS 2,4-Dichlorophenol	106	0.00 U	71.0	67	40-111
65-85-0	MS Benzoic acid	213	0.00 U	119	56	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	106	0.00	U	84.4	79	44-138
87-68-3	MS	Hexachlorobutadiene	106	0.00	U	57.6	54	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00	U	76.8	72	41-122
91-57-6	MS	2-Methylnaphthalene	106	0.00	U	63.3	59	29-109
91-20-3	MS	Naphthalene	106	0.00	U	61.1	57	31-108
90-12-0	MS	1-Methylnaphthalene	106	0.00	U	64.2	60	33-112
77-47-4	MS	Hexachlorocyclopentadiene	106	0.00	U	33.6	32	26-79
88-06-2	MS	2,4,6-Trichlorophenol	106	0.00	U	73.2	69	39-124
95-95-4	MS	2,4,5-Trichlorophenol	106	0.00	U	68.0	64	42-120
91-58-7	MS	2-Chloronaphthalene	106	0.00	U	58.3	55	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	106	0.00	U	72.4	68	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	106	0.00	U	89.4	84	42-144
131-11-3	MS	Dimethylphthalate	106	0.00	U	80.4	76	45-128
606-20-2	MS	2,6-Dinitrotoluene	106	0.00	U	77.9	73	46-124
121-14-2	MS	2,4-Dinitrotoluene	106	0.00	U	80.4	76	45-125
208-96-8	MS	Acenaphthylene	106	0.00	U	68.0	64	35-120
83-32-9	MS	Acenaphthene	106	0.00	U	71.6	67	35-117
51-28-5	MS	2,4-Dinitrophenol	106	0.00	U	86.2	81	27-122
132-64-9	MS	Dibenzofuran	106	0.00	U	68.5	64	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	106	0.00	U	77.1	72	40-128
84-66-2	MS	Diethylphthalate	106	0.00	U	81.4	76	43-127
100-02-7	MS	4-Nitrophenol	106	0.00	U	42.9	40	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	106	0.00	U	73.7	69	39-117
7005-72-3	MS	4-Chlorophenylphenylether	106	0.00	U	76.4	72	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	106	0.00	U	81.1	76	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	106	0.00	U	88.5	83	32-126
122-39-4	MS	Diphenylamine	106	0.00	U	68.0	64	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	106	0.00	U	68.2	64	38-120
101-55-3	MS	4-Bromophenylphenylether	106	0.00	U	74.7	70	39-121
118-74-1	MS	Hexachlorobenzene	106	0.00	U	75.7	71	40-118
87-86-5	MS	Pentachlorophenol	106	0.00	U	79.2	74	35-121
85-01-8	MS	Phenanthrene	106	0.00	U	73.6	69	40-115
120-12-7	MS	Anthracene	106	0.00	U	75.0	71	38-120
84-74-2	MS	Di-n-butylphthalate	106	0.00	U	81.8	77	41-128
206-44-0	MS	Fluoranthene	106	0.00	U	79.6	75	41-119
129-00-0	MS	Pyrene	106	0.00	U	79.0	74	35-128
85-68-7	MS	Butylbenzylphthalate	106	0.00	U	86.7	81	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	106	0.00	U	90.8	85	38-131
56-55-3	MS	Benzo(a)anthracene	106	0.00	U	86.1	81	39-120
218-01-9	MS	Chrysene	106	0.00	U	84.0	79	41-124
117-84-0	MS	Di-n-octylphthalate	106	0.00	U	88.4	83	37-134
205-99-2	MS	Benzo(b)fluoranthene	106	0.00	U	89.7	84	31-122
207-08-9	MS	Benzo(k)fluoranthene	106	0.00	U	85.7	81	33-123
50-32-8	MS	Benzo(a)pyrene	106	0.00	U	86.6	81	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike

Client ID: MD50-17-138988MS

Matrix: W

Lab Sample ID 1203810348

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:18

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	106	0.00 U	85.7	81	27-121
53-70-3	MS Dibenzo(a,h)anthracene	106	0.00 U	85.8	81	30-125
191-24-2	MS Benzo(ghi)perylene	106	0.00 U	81.9	77	24-126
123-91-1	MS 1,4-Dioxane	106	0.00 U	56.5	53	24-110
930-55-2	MS N-Nitrosopyrrolidine	106	0.00 U	66.9	63	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	106	0.00 U	65.6	62	32-101
1912-24-9	MS Atrazine	106	0.00 U	82.6	78	42-129
92-87-5	MS Benzidine	213	0.00 U	75.1	35	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	106	0.00 U	76.4	72	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	106	0.00 U	59.2	56	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

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	106	0.00	U	47.5	45	25-106	7	0-30
110-86-1	MSD Pyridine	106	0.00	U	50.5	48	24-93	1	0-30
62-53-3	MSD Aniline	106	0.00	U	67.8	64	37-113	0	0-30
108-95-2	MSD Phenol	106	0.00	U	38.4	36	23-82	3	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	106	0.00	U	56.0	53	39-114	4	0-30
95-57-8	MSD 2-Chlorophenol	106	0.00	U	59.5	56	37-108	4	0-30
541-73-1	MSD 1,3-Dichlorobenzene	106	0.00	U	49.9	47	27-97	5	0-30
106-46-7	MSD 1,4-Dichlorobenzene	106	0.00	U	50.1	47	28-97	6	0-30
95-50-1	MSD 1,2-Dichlorobenzene	106	0.00	U	52.8	50	28-99	4	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	106	0.00	U	62.7	59	32-127	6	0-30
100-51-6	MSD Benzyl alcohol	106	0.00	U	58.9	55	37-116	2	0-30
95-48-7	MSD o-Cresol	106	0.00	U	58.3	55	34-109	5	0-30
65794-96-9	MSD m,p-Cresols	106	0.00	U	61.8	58	36-120	0	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine N-Nitrosodipropylamine	106	0.00	U	56.5	53	42-118	8	0-30
67-72-1	MSD Hexachloroethane	106	0.00	U	50.3	47	29-94	2	0-30
98-95-3	MSD Nitrobenzene	106	0.00	U	61.1	57	38-123	6	0-30
78-59-1	MSD Isophorone	106	0.00	U	63.8	60	43-120	5	0-30
88-75-5	MSD 2-Nitrophenol	106	0.00	U	64.1	60	39-115	7	0-30
105-67-9	MSD 2,4-Dimethylphenol	106	0.00	U	60.7	57	39-107	4	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	106	0.00	U	61.3	58	42-118	5	0-30
120-83-2	MSD 2,4-Dichlorophenol	106	0.00	U	66.7	63	40-111	6	0-30
65-85-0	MSD Benzoic acid	213	0.00	U	119	56	17-95	0	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	106	0.00 U	82.9	78	44-138	2	0-30
87-68-3	MSD Hexachlorobutadiene	106	0.00 U	56.0	53	26-98	3	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	106	0.00 U	75.5	71	41-122	2	0-30
91-57-6	MSD 2-Methylnaphthalene	106	0.00 U	59.3	56	29-109	6	0-30
91-20-3	MSD Naphthalene	106	0.00 U	57.0	54	31-108	7	0-30
90-12-0	MSD 1-Methylnaphthalene	106	0.00 U	59.8	56	33-112	7	0-30
77-47-4	MSD Hexachlorocyclopentadiene	106	0.00 U	30.4	29	26-79	10	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	106	0.00 U	72.8	68	39-124	1	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	106	0.00 U	65.1	61	42-120	4	0-30
91-58-7	MSD 2-Chloronaphthalene	106	0.00 U	54.9	52	29-113	6	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	106	0.00 U	74.4	70	41-121	3	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	106	0.00 U	90.6	85	42-144	1	0-30
131-11-3	MSD Dimethylphthalate	106	0.00 U	83.5	79	45-128	4	0-30
606-20-2	MSD 2,6-Dinitrotoluene	106	0.00 U	81.3	76	46-124	4	0-30
121-14-2	MSD 2,4-Dinitrotoluene	106	0.00 U	85.7	81	45-125	6	0-30
208-96-8	MSD Acenaphthylene	106	0.00 U	66.9	63	35-120	2	0-30
83-32-9	MSD Acenaphthene	106	0.00 U	69.2	65	35-117	3	0-30
51-28-5	MSD 2,4-Dinitrophenol	106	0.00 U	87.3	82	27-122	1	0-30
132-64-9	MSD Dibenzofuran	106	0.00 U	67.8	64	38-113	1	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	106	0.00 U	78.6	74	40-128	2	0-30
84-66-2	MSD Diethylphthalate	106	0.00 U	85.3	80	43-127	5	0-30
100-02-7	MSD 4-Nitrophenol	106	0.00 U	45.3	43	17-85	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	106	0.00 U	75.8	71	39-117	3	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	106	0.00 U	77.1	72	39-121	1	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	106	0.00 U	87.4	82	30-133	7	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	106	0.00 U	91.6	86	32-126	4	0-30
122-39-4	MSD Diphenylamine	106	0.00 U	73.1	69	37-118	7	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	106	0.00 U	72.2	68	38-120	6	0-30
101-55-3	MSD 4-Bromophenylphenylether	106	0.00 U	78.8	74	39-121	5	0-30
118-74-1	MSD Hexachlorobenzene	106	0.00 U	81.6	77	40-118	7	0-30
87-86-5	MSD Pentachlorophenol	106	0.00 U	81.6	77	35-121	3	0-30
85-01-8	MSD Phenanthrene	106	0.00 U	79.7	75	40-115	8	0-30
120-12-7	MSD Anthracene	106	0.00 U	79.2	74	38-120	5	0-30
84-74-2	MSD Di-n-butylphthalate	106	0.00 U	87.1	82	41-128	6	0-30
206-44-0	MSD Fluoranthene	106	0.00 U	84.6	79	41-119	6	0-30
129-00-0	MSD Pyrene	106	0.00 U	76.8	72	35-128	3	0-30
85-68-7	MSD Butylbenzylphthalate	106	0.00 U	87.0	82	40-129	0	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	106	0.00 U	92.9	87	38-131	2	0-30
56-55-3	MSD Benzo(a)anthracene	106	0.00 U	87.8	83	39-120	2	0-30
218-01-9	MSD Chrysene	106	0.00 U	88.3	83	41-124	5	0-30
117-84-0	MSD Di-n-octylphthalate	106	0.00 U	94.8	89	37-134	7	0-30
205-99-2	MSD Benzo(b)fluoranthene	106	0.00 U	89.4	84	31-122	0	0-30
207-08-9	MSD Benzo(k)fluoranthene	106	0.00 U	85.4	80	33-123	0	0-30
50-32-8	MSD Benzo(a)pyrene	106	0.00 U	90.8	85	32-118	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1716

Sample Type: Matrix Spike Duplicate

Client ID: MD50-17-138988MSD

Matrix: W

Lab Sample ID 1203810349

Instrument: MSD1.I

Analysis Date: 06/14/2017 13:49

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1673582

Inj. Vol: 1 uL

Batch ID: 1673585

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	106	0.00 U	98.2	92	27-121	14	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	106	0.00 U	95.1	89	30-125	10	0-30
191-24-2	MSD Benzo(ghi)perylene	106	0.00 U	90.8	85	24-126	10	0-30
123-91-1	MSD 1,4-Dioxane	106	0.00 U	53.3	50	24-110	6	0-30
930-55-2	MSD N-Nitrosopyrrolidine	106	0.00 U	68.0	64	47-119	2	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	106	0.00 U	61.7	58	32-101	6	0-30
1912-24-9	MSD Atrazine	106	0.00 U	89.7	84	42-129	8	0-30
92-87-5	MSD Benzidine	213	0.00 U	98.8	46	15-130	27	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	106	0.00 U	90.0	85	34-124	16	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	106	0.00 U	54.5	51	26-102	8	0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2017-1716	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1673582	Instrument ID:	MSD1.I	Data File:	s061417.B\s1f1408.D
Lab Sample ID:	1203810346	Prep Date:	06/13/2017 17:55	Analyzed:	06/14/17 11:47
Column:	25x.20x.33				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1673582	1203810347	s061417.B\s1f1409.D	06/14/17	1217
02 MD50-17-138988MS	1203810348	s061417.B\s1f1411.D	06/14/17	1318
03 MD50-17-138988MSD	1203810349	s061417.B\s1f1412.D	06/14/17	1349
04 CAWA-17-133302	425329001	s061417.B\s1f1413.D	06/14/17	1419
05 CAWA-17-133340	425329004	s061417.B\s1f1414.D	06/14/17	1450

Quality Control Data

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

SDG Number: 2017-1716

Matrix: WATER

Lab Sample ID: 1203810346

Client Sample: QC for batch 1673582

Client: ARSL004

Project: QC

Client ID: MB for batch 1673582

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1673585

Inst: MSD1.I

Dilution: 1

Run Date: 06/14/2017 11:47

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 06/13/2017 17:55

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s061417.B\s1f1408.D

Column: 25x.20x.33

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

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

Page 2 of 3

SDG Number: 2017-1716		Matrix:	WATER
Lab Sample ID: 1203810346			
Client Sample: QC for batch 1673582	Client: ARSL004	Project:	QC
Client ID: MB for batch 1673582	Method: SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution:	1
Run Date: 06/14/2017 11:47	Analyst: JMB3	Inj. Vol:	1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 1000 mL	Final Volume:	1 mL
Data File: s061417.B\s1f1408.D	Column: 25x.20x.33		

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

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

Page 3 of 3

SDG Number: 2017-1716	Matrix: WATER
Lab Sample ID: 1203810346	
Client Sample: QC for batch 1673582	Client: ARSL004
Client ID: MB for batch 1673582	Method: SW846 3510C/8270D
Batch ID: 1673585	Inst: MSD1.I
Run Date: 06/14/2017 11:47	Analyst: JMB3
Prep Date: 06/13/2017 17:55	Aliquot: 1000 mL
Data File: s061417.B\slf1408.D	Column: 25x.20x.33
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.3	100	ug/L	60 (32%-124%)
2-Fluorobiphenyl	37.1	50.0	ug/L	74 (32%-112%)
2-Fluorophenol	34.1	100	ug/L	34 (15%-88%)
Nitrobenzene-d5	34.0	50.0	ug/L	68 (36%-115%)
Phenol-d5	20.8	100	ug/L	21 (15%-91%)
p-Terphenyl-d14	43.5	50.0	ug/L	87 (36%-121%)

Tentatively Identified Compound Summary

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

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

SDG Number: 2017-1716

Lab Sample ID: 1203810347

Client Sample: QC for batch 1673582

Client ID: LCS for batch 1673582

Batch ID: 1673585

Run Date: 06/14/2017 12:17

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1409.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		37.8	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		34.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		31.9	ug/L	3.00	10.0
122-66-7	Azobenzene		38.2	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		31.2	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		30.9	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		24.9	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		36.4	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		41.7	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		38.4	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		41.2	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.4	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		35.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		34.6	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		43.9	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		44.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		33.7	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		35.6	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		38.3	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		36.7	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		38.7	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		43.7	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		41.7	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		41.8	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		48.7	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		43.5	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.3	ug/L	3.00	10.0
83-32-9	Acenaphthene		41.1	ug/L	0.300	1.00
208-96-8	Acenaphthylene		38.7	ug/L	0.300	1.00
62-53-3	Aniline		38.5	ug/L	4.20	10.0
120-12-7	Anthracene		39.4	ug/L	0.300	1.00
1912-24-9	Atrazine		47.8	ug/L	3.00	10.0
92-87-5	Benzidine		51.7	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		44.7	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		44.4	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		44.7	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		43.8	ug/L	0.300	1.00

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

SDG Number: 2017-1716

Lab Sample ID: 1203810347

Client Sample: QC for batch 1673582

Client ID: LCS for batch 1673582

Batch ID: 1673585

Run Date: 06/14/2017 12:17

Prep Date: 06/13/2017 17:55

Data File: s061417.B\s1f1409.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD1.I

Analyst: JMB3

Aliquot: 1000 mL

Column: 25x.20x.33

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		43.8	ug/L	0.300	1.00
65-85-0	Benzoic acid		23.8	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.8	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		45.5	ug/L	3.00	10.0
218-01-9	Chrysene		43.9	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		42.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		45.3	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		45.9	ug/L	0.300	1.00
132-64-9	Dibenzofuran		39.3	ug/L	3.00	10.0
84-66-2	Diethylphthalate		45.1	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		44.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		37.7	ug/L	3.00	10.0
206-44-0	Fluoranthene		40.0	ug/L	0.300	1.00
86-73-7	Fluorene		42.0	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		41.9	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		34.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.8	ug/L	3.00	10.0
67-72-1	Hexachloroethane		31.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		46.4	ug/L	0.300	1.00
78-59-1	Isophorone		39.2	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		21.5	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		34.7	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		36.2	ug/L	3.00	10.0
91-20-3	Naphthalene		35.9	ug/L	0.300	1.00
98-95-3	Nitrobenzene		38.7	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		32.9	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.8	ug/L	0.300	1.00
108-95-2	Phenol		13.8	ug/L	3.00	10.0
129-00-0	Pyrene		42.9	ug/L	0.300	1.00
110-86-1	Pyridine		22.1	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		38.9	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		38.2	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		35.4	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		45.6	ug/L	3.00	10.0

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

Page 3 of 3

SDG Number: 2017-1716	Matrix: WATER
Lab Sample ID: 1203810347	
Client Sample: QC for batch 1673582	Client: ARSL004
Client ID: LCS for batch 1673582	Method: SW846 3510C/8270D
Batch ID: 1673585	Inst: MSD1.I
Run Date: 06/14/2017 12:17	Analyst: JMB3
Prep Date: 06/13/2017 17:55	Aliquot: 1000 mL
Data File: s061417.B\slf1409.D	Column: 25x.20x.33
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		29.4	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.4	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		30.7	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		39.8	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		40.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.1	100	ug/L	81	(32%-124%)
2-Fluorobiphenyl	39.3	50.0	ug/L	79	(32%-112%)
2-Fluorophenol	43.9	100	ug/L	44	(15%-88%)
Nitrobenzene-d5	39.6	50.0	ug/L	79	(36%-115%)
Phenol-d5	25.1	100	ug/L	25	(15%-91%)
p-Terphenyl-d14	44.0	50.0	ug/L	88	(36%-121%)

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

SDG Number: 2017-1716
Lab Sample ID: 1203810348
Client Sample: QC for batch 1673582
Client ID: MD50-17-138988MS
Batch ID: 1673585
Run Date: 06/14/2017 13:18
Prep Date: 06/13/2017 17:55
Data File: s061417.B\s1f1411.D

Date Collected: 06/09/2017 10:00
Date Received: 06/13/2017 09:10
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD1.I
Analyst: JMB3
Aliquot: 470 mL
Column: 25x.20x.33

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		65.6	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		59.2	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		55.1	ug/L	6.38	21.3
122-66-7	Azobenzene		68.2	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		52.4	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		52.9	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		56.5	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		64.2	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		77.1	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		68.0	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		73.2	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		71.0	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		63.0	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		86.2	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		80.4	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		77.9	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		58.3	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		62.2	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		88.5	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		63.3	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		69.1	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		76.4	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		74.7	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		76.8	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		84.4	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		76.4	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		42.9	ug/L	6.38	21.3
83-32-9	Acenaphthene		71.6	ug/L	0.638	2.13
208-96-8	Acenaphthylene		68.0	ug/L	0.638	2.13
62-53-3	Aniline		67.9	ug/L	8.94	21.3
120-12-7	Anthracene		75.0	ug/L	0.638	2.13
1912-24-9	Atrazine		82.6	ug/L	6.38	21.3
92-87-5	Benzidine		75.1	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		86.1	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		86.6	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		89.7	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		81.9	ug/L	0.638	2.13

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810348	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:18	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1411.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		85.7	ug/L	0.638	2.13
65-85-0	Benzoic acid		119	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		60.1	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		86.7	ug/L	6.38	21.3
218-01-9	Chrysene		84.0	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		81.8	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		88.4	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		85.8	ug/L	0.638	2.13
132-64-9	Dibenzofuran		68.5	ug/L	6.38	21.3
84-66-2	Diethylphthalate		81.4	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		80.4	ug/L	6.38	21.3
88-85-7	Dinoseb	U	21.3	ug/L	6.38	21.3
122-39-4	Diphenylamine		68.0	ug/L	6.38	21.3
206-44-0	Fluoranthene		79.6	ug/L	0.638	2.13
86-73-7	Fluorene		73.7	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		75.7	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		57.6	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		33.6	ug/L	6.38	21.3
67-72-1	Hexachloroethane		51.4	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		85.7	ug/L	0.638	2.13
78-59-1	Isophorone		66.9	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		50.8	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	21.3	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	21.3	ug/L	6.38	21.3
621-64-7	N-Nitrosodi--n-propylamine		61.0	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		66.9	ug/L	6.38	21.3
91-20-3	Naphthalene		61.1	ug/L	0.638	2.13
98-95-3	Nitrobenzene		64.9	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	21.3	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		79.2	ug/L	6.38	21.3
85-01-8	Phenanthrene		73.6	ug/L	0.638	2.13
108-95-2	Phenol		39.6	ug/L	6.38	21.3
129-00-0	Pyrene		79.0	ug/L	0.638	2.13
110-86-1	Pyridine		51.3	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		66.4	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		64.2	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		58.1	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		90.8	ug/L	6.38	21.3

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810348	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:18	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1411.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		61.8	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		89.4	ug/L	6.38	21.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		61.3	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		72.4	ug/L	6.38	21.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		81.1	ug/L	6.38	21.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	148	213	ug/L	70 (32%-124%)
2-Fluorobiphenyl	67.0	106	ug/L	63 (32%-112%)
2-Fluorophenol	103	213	ug/L	48 (15%-88%)
Nitrobenzene-d5	66.2	106	ug/L	62 (36%-115%)
Phenol-d5	75.1	213	ug/L	35 (15%-91%)
p-Terphenyl-d14	81.7	106	ug/L	77 (36%-121%)

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810349	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:49	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1412.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		61.7	ug/L	6.38	21.3
120-82-1	1,2,4-Trichlorobenzene		54.5	ug/L	6.38	21.3
95-50-1	1,2-Dichlorobenzene		52.8	ug/L	6.38	21.3
122-66-7	Azobenzene		72.2	ug/L	6.38	21.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		49.9	ug/L	6.38	21.3
106-46-7	1,4-Dichlorobenzene		50.1	ug/L	6.38	21.3
123-91-1	1,4-Dioxane		53.3	ug/L	6.38	21.3
90-12-0	1-Methylnaphthalene		59.8	ug/L	0.638	2.13
58-90-2	2,3,4,6-Tetrachlorophenol		78.6	ug/L	6.38	21.3
95-95-4	2,4,5-Trichlorophenol		65.1	ug/L	6.38	21.3
88-06-2	2,4,6-Trichlorophenol		72.8	ug/L	6.38	21.3
120-83-2	2,4-Dichlorophenol		66.7	ug/L	6.38	21.3
105-67-9	2,4-Dimethylphenol		60.7	ug/L	6.38	21.3
51-28-5	2,4-Dinitrophenol		87.3	ug/L	10.6	42.6
121-14-2	2,4-Dinitrotoluene		85.7	ug/L	6.38	21.3
606-20-2	2,6-Dinitrotoluene		81.3	ug/L	6.38	21.3
91-58-7	2-Chloronaphthalene		54.9	ug/L	0.872	2.13
95-57-8	2-Chlorophenol		59.5	ug/L	6.38	21.3
534-52-1	2-Methyl-4,6-dinitrophenol		91.6	ug/L	6.38	21.3
91-57-6	2-Methylnaphthalene		59.3	ug/L	0.638	2.13
88-75-5	2-Nitrophenol		64.1	ug/L	6.38	21.3
91-94-1	3,3'-Dichlorobenzidine		90.0	ug/L	6.38	21.3
101-55-3	4-Bromophenylphenylether		78.8	ug/L	6.38	21.3
59-50-7	Parachlorometa cresol		75.5	ug/L	6.38	21.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		82.9	ug/L	7.02	21.3
7005-72-3	4-Chlorophenylphenylether		77.1	ug/L	6.38	21.3
100-02-7	4-Nitrophenol		45.3	ug/L	6.38	21.3
83-32-9	Acenaphthene		69.2	ug/L	0.638	2.13
208-96-8	Acenaphthylene		66.9	ug/L	0.638	2.13
62-53-3	Aniline		67.8	ug/L	8.94	21.3
120-12-7	Anthracene		79.2	ug/L	0.638	2.13
1912-24-9	Atrazine		89.7	ug/L	6.38	21.3
92-87-5	Benzidine		98.8	ug/L	8.30	21.3
56-55-3	Benzo(a)anthracene		87.8	ug/L	0.638	2.13
50-32-8	Benzo(a)pyrene		90.8	ug/L	0.638	2.13
205-99-2	Benzo(b)fluoranthene		89.4	ug/L	0.638	2.13
191-24-2	Benzo(ghi)perylene		90.8	ug/L	0.638	2.13

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

SDG Number:	2017-1716	Date Collected:	06/09/2017 10:00	Matrix:	W
Lab Sample ID:	1203810349	Date Received:	06/13/2017 09:10		
Client Sample:	QC for batch 1673582	Client:	ARSL004	Project:	QC
Client ID:	MD50-17-138988MSD	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1673585	Inst:	MSD1.I	Dilution:	1
Run Date:	06/14/2017 13:49	Analyst:	JMB3	Inj. Vol:	1 uL
Prep Date:	06/13/2017 17:55	Aliquot:	470 mL	Final Volume:	1 mL
Data File:	s061417.B\s1f1412.D	Column:	25x.20x.33		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		85.4	ug/L	0.638	2.13
65-85-0	Benzoic acid		119	ug/L	12.8	42.6
100-51-6	Benzyl alcohol		58.9	ug/L	6.38	21.3
85-68-7	Butylbenzylphthalate		87.0	ug/L	6.38	21.3
218-01-9	Chrysene		88.3	ug/L	0.638	2.13
84-74-2	Di-n-butylphthalate		87.1	ug/L	6.38	21.3
117-84-0	Di-n-octylphthalate		94.8	ug/L	6.38	21.3
53-70-3	Dibenzo(a,h)anthracene		95.1	ug/L	0.638	2.13
132-64-9	Dibenzofuran		67.8	ug/L	6.38	21.3
84-66-2	Diethylphthalate		85.3	ug/L	6.38	21.3
131-11-3	Dimethylphthalate		83.5	ug/L	6.38	21.3
88-85-7	Dinoseb	U	21.3	ug/L	6.38	21.3
122-39-4	Diphenylamine		73.1	ug/L	6.38	21.3
206-44-0	Fluoranthene		84.6	ug/L	0.638	2.13
86-73-7	Fluorene		75.8	ug/L	0.638	2.13
118-74-1	Hexachlorobenzene		81.6	ug/L	6.38	21.3
87-68-3	Hexachlorobutadiene		56.0	ug/L	6.38	21.3
77-47-4	Hexachlorocyclopentadiene		30.4	ug/L	6.38	21.3
67-72-1	Hexachloroethane		50.3	ug/L	6.38	21.3
193-39-5	Indeno(1,2,3-cd)pyrene		98.2	ug/L	0.638	2.13
78-59-1	Isophorone		63.8	ug/L	7.45	21.3
62-75-9	N-Methyl-N-nitrosomethylamine		47.5	ug/L	6.38	21.3
924-16-3	N-Nitrosodi-n-butylamine	U	21.3	ug/L	6.38	21.3
55-18-5	N-Nitrosodiethylamine	U	21.3	ug/L	6.38	21.3
621-64-7	N-Nitrosodi--n-propylamine		56.5	ug/L	6.38	21.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		68.0	ug/L	6.38	21.3
91-20-3	Naphthalene		57.0	ug/L	0.638	2.13
98-95-3	Nitrobenzene		61.1	ug/L	6.38	21.3
608-93-5	Pentachlorobenzene	U	21.3	ug/L	6.38	21.3
87-86-5	Pentachlorophenol		81.6	ug/L	6.38	21.3
85-01-8	Phenanthrene		79.7	ug/L	0.638	2.13
108-95-2	Phenol		38.4	ug/L	6.38	21.3
129-00-0	Pyrene		76.8	ug/L	0.638	2.13
110-86-1	Pyridine		50.5	ug/L	6.38	21.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		62.7	ug/L	6.38	21.3
111-91-1	bis(2-Chloroethoxy)methane		61.3	ug/L	6.38	21.3
111-44-4	bis(2-Chloroethyl) ether		56.0	ug/L	6.38	21.3
117-81-7	bis(2-Ethylhexyl)phthalate		92.9	ug/L	6.38	21.3

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

SDG Number: 2017-1716	Date Collected: 06/09/2017 10:00	Matrix: W
Lab Sample ID: 1203810349	Date Received: 06/13/2017 09:10	
Client Sample: QC for batch 1673582	Client: ARSL004	Project: QC
Client ID: MD50-17-138988MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1673585	Inst: MSD1.I	Dilution: 1
Run Date: 06/14/2017 13:49	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 06/13/2017 17:55	Aliquot: 470 mL	Final Volume: 1 mL
Data File: s061417.B\s1f1412.D	Column: 25x.20x.33	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		61.8	ug/L	7.87	21.3
99-09-2	3-Nitroaniline		90.6	ug/L	6.38	21.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		58.3	ug/L	6.38	21.3
88-74-4	2-Nitroaniline		74.4	ug/L	6.38	21.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		87.4	ug/L	6.38	21.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	158	213	ug/L	74	(32%-124%)
2-Fluorobiphenyl	64.9	106	ug/L	61	(32%-112%)
2-Fluorophenol	99.9	213	ug/L	47	(15%-88%)
Nitrobenzene-d5	62.5	106	ug/L	59	(36%-115%)
Phenol-d5	73.5	213	ug/L	35	(15%-91%)
p-Terphenyl-d14	81.3	106	ug/L	76	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

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: 1675216

Prep Batch Number: 1675214

Sample Analysis

Sample ID	Client ID
425329003	425329003 (CAWA-17-133330)
1203814204	Interference Check Sample (ICS)
1203814194	Method Blank (MB)
1203814195	Laboratory Control Sample (LCS)
1203814196	425115002(CAWA-17-133326) Matrix Spike (MS)
1203814197	425115002(CAWA-17-133326) 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 425115002 (CAWA-17-133326) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The recoveries of Perchlorate and Perchlorate-101 were not within the acceptance limits in 1203814196 (CAWA-17-133326MS) and 1203814197 (CAWA-17-133326MSD). This was due to the background concentration in the parent sample, 425115002 (CAWA-17-133326).

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

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: 24 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133330Date Received: 13-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 425329003Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.268	ug/L		1	19-JUN-17 20:38	per0619026a
	Perchlorate Isotope Ratio			2.71			1	19-JUN-17 20:38	per0619026a
14797-73-0	Perchlorate-101	.05	.2	0.288	ug/L		1	19-JUN-17 20:38	per0619026a
	Perchlorate-O(18)			0.399	ug/L		1	19-JUN-17 20:38	per0619026a

^ 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): 2017-1716

Extract Batch Code: 1675214

Date Filtered: 19-JUN-17

Matrix: WATER

Sample ID: 1203814195

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.197	ug/L	99		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.189	ug/L	95		85 - 115
Perchlorate-O(18)		.439	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): 2017-1716

Extract Batch Code: 1675214

Date Extracted: 19-JUN-17

GEL MS/PS ID: 1203814196

Client ID: CAWA-17-133326

GEL MSD/PSD ID: 1203814197

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	1.05	ug/L	1.12	34 *	1.16	53 *	3	30	75 - 125
Perchlorate Isotope Ratio	0	2.92		2.78		2.83		2		-
Perchlorate-101	0.200	1.05	ug/L	1.17	61 *	1.19	71 *	2	30	75 - 125
Perchlorate-O(18)	0	0.410	ug/L	0.415		.423		2		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 19-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814194Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate Isotope Ratio						1	19-JUN-17 18:15	per0619013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	19-JUN-17 18:15	per0619013a
	Perchlorate-O(18)			0.475	ug/L		1	19-JUN-17 18:15	per0619013a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 19-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814195Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate Isotope Ratio			3.04			1	19-JUN-17 18:26	per0619014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	19-JUN-17 18:26	per0619014a
	Perchlorate-O(18)			0.439	ug/L		1	19-JUN-17 18:26	per0619014a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814204Date Filtered: 19-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.186	ug/L	J	1	19-JUN-17 18:37	per0619015a
	Perchlorate Isotope Ratio			2.58			1	19-JUN-17 18:37	per0619015a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	19-JUN-17 18:37	per0619015a
	Perchlorate-O(18)			0.432	ug/L		1	19-JUN-17 18:37	per0619015a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDate Received: 09-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814196Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.12	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate Isotope Ratio			2.78			1	19-JUN-17 18:59	per0619017a
14797-73-0	Perchlorate-101	.05	.2	1.17	ug/L		1	19-JUN-17 18:59	per0619017a
	Perchlorate-O(18)			0.415	ug/L		1	19-JUN-17 18:59	per0619017a

^ 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: 1675214Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133326MSDDate Received: 09-JUN-17GEL Job No (SDG): 2017-1716GEL Sample ID: 1203814197Date Filtered: 19-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	1.16	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate Isotope Ratio			2.83			1	19-JUN-17 19:10	per0619018a
14797-73-0	Perchlorate-101	.05	.2	1.19	ug/L		1	19-JUN-17 19:10	per0619018a
	Perchlorate-O(18)			0.423	ug/L		1	19-JUN-17 19:10	per0619018a

^ 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 #: 2017-1716
Work Order #: 425329**

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: 1673869

Prep Batch Number: 1673868

Sample Analysis

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

Sample ID	Client ID
425329002	CAWA-17-133302
425329006	CAWA-17-135753
1203811082	Method Blank (MB)
1203811083	Laboratory Control Sample (LCS)
1203811084	425329006(CAWA-17-135753) Matrix Spike (MS)
1203811085	425329006(CAWA-17-135753) 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 continuing calibration verification standards (CCV) have not met requirements of 80-120% for in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low CCV with all target analytes meeting acceptance limits. Since the target analyte was not detected in the associated samples, the data are reported.

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

The Low Level Calibration Verification Standard (CRI) did not meet requirements of 70-130% for samples in this SDG. Please refer to Form 7 of the data package for a list of recoveries. Since the recoveries are biased high and target analytes were not detected in the associated samples, the data are considered unaffected. The data are reported.

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 425329006 (CAWA-17-135753) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS and/or MSD (See Below) did not meet acceptance criteria for the recovery of spiked analytes. Since similar recoveries were observed, the non-conforming recoveries are attributed to sample matrix interference. The data are reported.

Sample	Analyte	Value
1203811084 (CAWA-17-135753MS)	Tetryl	38* (50%-126%)
1203811085 (CAWA-17-135753MSD)	Tetryl	45* (50%-126%)

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUL 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133302

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329002

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706026.wiff

Date Analyzed: 07-JUL-17 00:34

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.266	U	0.0851	0.266
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.266	U	0.0851	0.266
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.266	U	0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.266	U	0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.266	U	0.0851	0.266
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.266	U	0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.266	U	0.0851	0.266
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.266	U	0.0851	0.266
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.266	U	0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.266	U	0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.266	U	0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.266	U	0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.266	U	0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133302

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329002

Sample Amount 940 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.266	U	0.0851	0.266
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.266	U	0.0851	0.266
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.532	U	0.0851	0.532
479-45-8	Tetryl				
78-11-5	PETN	.532	U	0.106	0.532
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.532	U	0.160	0.532
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1.06	U	0.319	1.06
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.06	U	0.319	1.06
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.06	U	0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.66	U	0.532	2.66
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.66	U	0.532	2.66
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329006

Sample Amount 925 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706027.wiff

Date Analyzed: 07-JUL-17 01:08

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.27	U	0.0865	0.270
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.27	U	0.0865	0.270
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.27	U	0.0865	0.270
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.27	U	0.0865	0.270
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.27	U	0.0865	0.270
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.27	U	0.0865	0.270
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.27	U	0.0865	0.270
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.27	U	0.0865	0.270
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.27	U	0.0865	0.270
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.27	U	0.0865	0.270
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.27	U	0.0886	0.270
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.27	U	0.0865	0.270
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.27	U	0.0865	0.270
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 425329006

Sample Amount 925 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.27	U	0.0865	0.270
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.27	U	0.0865	0.270
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.541	U	0.0865	0.541
479-45-8	Tetryl				
78-11-5	PETN	.541	U	0.108	0.541
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.541	U	0.162	0.541
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1.08	U	0.324	1.08
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.08	U	0.324	1.08
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.324	1.08
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.7	U	0.541	2.70
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.7	U	0.541	2.70
6629-29-4	2,4-Diamino-6-nitrotoluene				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1716**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
425329002	CAWA-17-133302	91	55 - 115	
425329006	CAWA-17-135753	97	55 - 115	
1203811082	MB for batch 1673868	97	55 - 115	
1203811083	LCS for batch 1673868	90	55 - 115	
1203811084	CAWA-17-135753MS	92	55 - 115	
1203811085	CAWA-17-135753MSD	91	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) 2017-1716

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL LCS ID: 1203811083

GEL LCSDUP ID: .

Analysis Date/Time: 06-JUL-17 19:27

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
tris(o-cresyl) phosphate	5	2.32	46					43 - 104
p-Nitrotoluene	5	4.55	91					66 - 127
1,3,5-Trinitrobenzene	5	4.68	94					70 - 110
2,4,6-Trinitrotoluene	5	4.76	95					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.41	88					50 - 121
2,4-Dinitrotoluene	5	4.46	89					71 - 110
2,6-Diamino-4-nitrotoluene	5	5.18	104					53 - 127
2,6-Dinitrotoluene	5	4.23	85					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.6	92					70 - 112
3,5-Dinitroaniline	5	4.79	96					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.7	94					74 - 116
HMX	5	3.87	77					58 - 113
Nitrobenzene	5	4.29	86					64 - 115
PETN	5	4.76	95					57 - 126
RDX	5	4.13	83					64 - 117
TATB	2.5	1.7	68					47 - 135
Tetryl	5	2.94	59					55 - 122
m-Dinitrobenzene	5	4.42	88					74 - 117
m-Nitrotoluene	5	4.15	83					66 - 114
o-Nitrotoluene	5	4.32	86					64 - 115

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-17-135753

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Extract Batch Code: 1673868

Date Extracted: 14-JUN-17

GEL Spike ID: 1203811084

GEL SpikeDup ID: 1203811085

Analysis Date/Time: 07-JUL-17 01:42

MSD Analysis Date/Time: 07-JUL-17 02:16

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	5.55556	0	4.99	90	4.7	85	6	30	67 - 111
2,4,6-Trinitrotoluene	5.55556	0	5.11	92	5.62	102	9	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.55556	0	5.1	92	6.5	118	24	30	50 - 121
2,4-Dinitrotoluene	5.55556	0	4.77	86	5.41	98	13	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.55556	0	5.82	105	5.77	104	1	30	53 - 127
2,6-Dinitrotoluene	5.55556	0	4.63	83	4.94	89	6	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.55556	0	4.8	86	5.1	92	6	30	67 - 115
3,5-Dinitroaniline	5.55556	0	5.43	98	5.61	102	3	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.55556	0	5.11	92	5.44	98	6	30	65 - 120
HMX	5.55556	0	4.24	76	3.94	71	7	30	44 - 128
Nitrobenzene	5.55556	0	4.3	77	4.4	80	2	30	62 - 116
PETN	5.55556	0	4.77	86	5.41	98	13	30	51 - 131
RDX	5.55556	.012	4.65	83	4.18	75	11	30	57 - 125
TATB	2.77778	0	2.04	74	1.8	65	13	30	38 - 149
Tetryl	5.55556	0	2.11	38 *	2.51	45 *	17	30	50 - 126
m-Dinitrobenzene	5.55556	0	5.04	91	5.17	94	3	30	74 - 117
m-Nitrotoluene	5.55556	0	4.27	77	4.59	83	7	30	59 - 120
o-Nitrotoluene	5.55556	0	3.82	69	4.13	75	8	30	56 - 119
p-Nitrotoluene	5.55556	0	4.45	80	4.59	83	3	30	61 - 129
tris(o-cresyl) phosphate	5.55556	0	2.99	54	3.43	62	14	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 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706016.wiff

Date Analyzed: 06-JUL-17 18:53

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811082

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.5	U	0.080	0.500
479-45-8	Tetryl				
78-11-5	PETN	.5	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706017.wiff

Date Analyzed: 06-JUL-17 19:27

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6 <i>13980-04-6</i>	TNX <i>TNX</i>	.25	U	0.080	0.250
5755-27-1 <i>5755-27-1</i>	MNX <i>MNX</i>	.25	U	0.080	0.250
80251-29-2 <i>80251-29-2</i>	DNX <i>DNX</i>	.25	U	0.080	0.250
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	1.7		0.300	1.00
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	2.32		0.300	1.00
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	2.94		0.080	0.500
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	3.87		0.080	0.250
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	4.13		0.080	0.250
99-08-1 <i>99-08-1</i>	m-Nitrotoluene <i>m-Nitrotoluene</i>	4.15		0.080	0.250
606-20-2 <i>606-20-2</i>	2,6-Dinitrotoluene <i>2,6-Dinitrotoluene</i>	4.23		0.080	0.250
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	4.29		0.080	0.250
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	4.32		0.082	0.250
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	4.41		0.500	2.50

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1673868

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811083

Sample Amount 1000 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.42		0.080	0.250
99-65-0	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.46		0.080	0.250
121-14-2	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.55		0.150	0.500
99-99-0	<i>p-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.6		0.080	0.250
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.68		0.080	0.250
99-35-4	<i>1,3,5-Trinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.7		0.080	0.250
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.76		0.080	0.250
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
78-11-5	PETN	4.76		0.100	0.500
78-11-5	<i>PETN</i>				
618-87-1	3,5-Dinitroaniline	4.79		0.300	1.00
618-87-1	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.18		0.500	2.50
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706028.wiff

Date Analyzed: 07-JUL-17 01:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.278	U	0.0889	0.278
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.278	U	0.0889	0.278
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.278	U	0.0889	0.278
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	2.04		0.333	1.11
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.11		0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	2.99		0.333	1.11
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
88-72-2	o-Nitrotoluene	3.82		0.0911	0.278
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
2691-41-0	HMX	4.24		0.0889	0.278
<i>2691-41-0</i>	<i>HMX</i>				
99-08-1	m-Nitrotoluene	4.27		0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.3		0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.45		0.167	0.556
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.63		0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-82-4	RDX	4.65		0.0889	0.278
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811084

Sample Amount 900 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.77		0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
78-11-5	PETN	4.77		0.111	0.556
<i>78-11-5</i>	<i>PETN</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.8		0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.99		0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	5.04		0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.1		0.556	2.78
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.11		0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.11		0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.43		0.333	1.11
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.82		0.556	2.78
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0706029.wiff

Date Analyzed: 07-JUL-17 02:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.276	U	0.0884	0.276
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.276	U	0.0884	0.276
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.276	U	0.0884	0.276
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.8		0.331	1.10
<i>3058-38-6</i>	<i>TATB</i>				
479-45-8	Tetryl	2.51		0.0884	0.552
<i>479-45-8</i>	<i>Tetryl</i>				
78-30-8	tris(o-cresyl) phosphate	3.43		0.331	1.10
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	3.94		0.0884	0.276
<i>2691-41-0</i>	<i>HMX</i>				
88-72-2	o-Nitrotoluene	4.13		0.0906	0.276
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.18		0.0884	0.276
<i>121-82-4</i>	<i>RDX</i>				
98-95-3	Nitrobenzene	4.4		0.0884	0.276
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.59		0.0884	0.276
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.59		0.166	0.552
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.7		0.0884	0.276
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-135753(425329006MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-1716

Matrix: WATER

GEL Sample ID: 1203811085

Sample Amount 905 mL

Date Received: 13-JUN-17

Moisture: .

Extraction Batch ID: 1673868

Extraction Type Sol Exchange

Date Extracted: 14-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
606-20-2	2,6-Dinitrotoluene	4.94		0.0884	0.276
606-20-2	2,6-Dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.1		0.0884	0.276
35572-78-2	2-Amino-4,6-dinitrotoluene				
99-65-0	m-Dinitrobenzene	5.17		0.0884	0.276
99-65-0	m-Dinitrobenzene				
121-14-2	2,4-Dinitrotoluene	5.41		0.0884	0.276
121-14-2	2,4-Dinitrotoluene				
78-11-5	PETN	5.41		0.110	0.552
78-11-5	PETN				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.44		0.0884	0.276
19406-51-0	4-Amino-2,6-dinitrotoluene				
618-87-1	3,5-Dinitroaniline	5.61		0.331	1.10
618-87-1	3,5-Dinitroaniline				
118-96-7	2,4,6-Trinitrotoluene	5.62		0.0884	0.276
118-96-7	2,4,6-Trinitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.77		0.552	2.76
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.5		0.552	2.76
6629-29-4	2,4-Diamino-6-nitrotoluene				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1716Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:20GEL Data File: EXP0706001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	1.11
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1716Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 06-JUL-17 10:55GEL Data File: EXP0706002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 06-JUL-17 15:28

GEL Data File: EXP0706010.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
RDX	0	1.77
Tetryl	0	1.74
m-Dinitrobenzene	0	1.58
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	1.68
tris(o-cresyl) phosphate	0	11.24
TATB	0	1.35
3,5-Dinitroaniline	0	1.88
2,4-Diamino-6-nitrotoluene	0	1.38
2,6-Diamino-4-nitrotoluene	0	1.71
DNX	0	1.94
MXN	0	1.65
TNX	0	1.66
1,3,5-Trinitrobenzene	0	1.64
2,4,6-Trinitrotoluene	0	1.88
2,4-Dinitrotoluene	0	1.85
2,6-Dinitrotoluene	0	1.71
2-Amino-4,6-dinitrotoluene	0	1.75
4-Amino-2,6-dinitrotoluene	0	2.03
HMX	0	2.05
Nitrobenzene	0	0
Nitroglycerin	0	3.38
PETN	0	3.24

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 06-JUL-17 17:44

GEL Data File: EXP0706014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	7.71
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	.97
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): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 06-JUL-17 21:43

GEL Data File: EXP0706021.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 06-JUL-17 23:26

GEL Data File: EXP0706024.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.04
tris(o-cresyl) phosphate	0	7.15
TATB	0	0
3,5-Dinitroaniline	0	.96
2,4-Diamino-6-nitrotoluene	0	.97
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	.83
TNX	0	.99
1,3,5-Trinitrobenzene	0	.86
2,4,6-Trinitrotoluene	0	1.19
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	.87
4-Amino-2,6-dinitrotoluene	0	1.03
HMX	0	.88
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.92
RDX	0	.87
Tetryl	0	1.04
m-Dinitrobenzene	0	.99
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): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 07-JUL-17 02:50

GEL Data File: EXP0706030.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
1,3,5-Trinitrobenzene	0	1.02
2,4,6-Trinitrotoluene	0	1.27
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.19
4-Amino-2,6-dinitrotoluene	0	1.32
HMX	0	1.11
Nitrobenzene	0	1.25
Nitroglycerin	0	1.42
PETN	0	2.8
RDX	0	.83
Tetryl	0	.78
m-Dinitrobenzene	0	.93
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	10.65
TATB	0	0
3,5-Dinitroaniline	0	1.1
2,4-Diamino-6-nitrotoluene	0	1.2
2,6-Diamino-4-nitrotoluene	0	1.33
DNX	0	0
MNX	0	0
TNX	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1716

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 07-JUL-17 03:59

GEL Data File: EXP0706032.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.06
tris(o-cresyl) phosphate	0	6.27
TATB	0	0
3,5-Dinitroaniline	0	.92
2,4-Diamino-6-nitrotoluene	0	.99
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	.72
TNX	0	0
1,3,5-Trinitrobenzene	0	.85
2,4,6-Trinitrotoluene	0	1.07
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	1.03
4-Amino-2,6-dinitrotoluene	0	1.14
HMX	0	1
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	1.79
RDX	0	.85
Tetryl	0	1
m-Dinitrobenzene	0	.89
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 #: 2017-1716
Work Order #: 425329

Sample ID	Client ID
425329002	CAWA-17-133302
425329003	CAWA-17-133330
1203813734	Method Blank (MB) ICP
1203813735	Laboratory Control Sample (LCS)
1203813738	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813736	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813737	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203813739	Method Blank (MB) ICP-MS
1203813740	Laboratory Control Sample (LCS)
1203813743	425329003(CAWA-17-133330L) Serial Dilution (SD)
1203813741	425329003(CAWA-17-133330D) Sample Duplicate (DUP)
1203813742	425329003(CAWA-17-133330S) Matrix Spike (MS)
1203811040	Method Blank (MB) CVAA
1203811041	Laboratory Control Sample (LCS)
1203811046	425358001(NonSDGL) Serial Dilution (SD)
1203811042	425358001(NonSDGD) Sample Duplicate (DUP)
1203811044	425358001(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 425329002 and 003 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1675026, 1675028, 1673861 and 1679789
Prep Batch :	1675025, 1675027 and 1673859
Standard Operating Procedures:	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 30, GL-MA-E-010 REV# 34 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 P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The 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: 425329003 (CAWA-17-133330)-ICP and ICP-MS and 425358001 (NonSDG)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate

value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1716 GEL Work Order: 425329

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: 05 JUL 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425329002**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133302**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/15/17 13:14	061517W1-3	1673861

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 425329003**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133330**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/15/17 13:16	061517W1-3	1673861

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 425329003

BASIS: As Received

DATE COLLECTED 08-JUN-17

CLIENT ID: CAWA-17-133330

LEVEL: Low

DATE RECEIVED 13-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-38-2	Arsenic	2.53	ug/L	J	2	5	5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-39-3	Barium	12.2	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-70-2	Calcium	8810	ug/L		50	200	200	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7439-95-4	Magnesium	2560	ug/L		110	300	300	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7439-98-7	Molybdenum	2.55	ug/L		0.2	0.5	0.5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-09-7	Potassium	1520	ug/L		50	150	150	1	P	HSC	06/28/17 19:00	062817-1	1675026
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7631-86-9	Silica	57300	ug/L		53	213	213	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-23-5	Sodium	14000	ug/L		100	300	300	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-24-6	Strontium	59.8	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-61-1	Uranium	0.915	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/28/17 13:06	170628-2	1675028
7440-62-2	Vanadium	8.58	ug/L		1	5	5	1	P	HSC	06/28/17 19:00	062817-1	1675026
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/28/17 19:00	062817-1	1675026

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1716**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 425329003**BASIS:** As Received**DATE COLLECTED** 08-JUN-17**CLIENT ID:** CAWA-17-133330**LEVEL:** Low**DATE RECEIVED** 13-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	32.6	mg/L		0.453	1.24	1.24	1		TXT1	07/05/17 14:28		1679789

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1673861	1673859	EPA 245.1/245.2 Prep	20	mL	20	mL	06/14/17	AXS5
1675026	1675025	SW846 3005A	50	mL	50	mL	06/19/17	SXW1
1675028	1675027	SW846 3005A	50	mL	50	mL	06/19/17	SXW1

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1716

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>
1203811040	Mercury	0.067	ug/L	+/-1	U	AV	0.067	1
1203813734	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	105	ug/L	+/-200	J	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	3.3	ug/L	+/-10	U	P	3.3	10
1203813739	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

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID: WT_ESR-17-137413S

Contract: ESHL00114 Level: Low

Matrix: STORM WATER % Solids:

Sample ID: 425358001 Spike ID: 1203811044

<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	2.15		0.067	U	2	107		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID: CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813737

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4750		68	U	5000	94.9		P
Barium	ug/L	75-125	501		12.2		500	97.8		P
Beryllium	ug/L	75-125	497		1	U	500	99.3		P
Boron	ug/L	75-125	514		15	U	500	101		P
Calcium	ug/L	75-125	13100		8810		5000	86.3		P
Cobalt	ug/L	75-125	493		1	U	500	98.7		P
Copper	ug/L	75-125	510		3	U	500	102		P
Iron	ug/L	75-125	4870		30	U	5000	97		P
Magnesium	ug/L	75-125	7250		2560		5000	93.8		P
Manganese	ug/L	75-125	483		2	U	500	96.5		P
Potassium	ug/L	75-125	6390		1520		5000	97.4		P
Silica	ug/L		60300		57300		10700	28.2	N/A	P
Sodium	ug/L	75-125	18400		14000		5000	88.8		P
Strontium	ug/L	75-125	530		59.8		500	94.1		P
Tin	ug/L	75-125	496		2.5	U	500	99		P
Vanadium	ug/L	75-125	509		8.58		500	100		P
Zinc	ug/L	75-125	469		3.3	U	500	93.3		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1716 Client ID CAWA-17-133330S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 425329003 Spike ID: 1203813742

<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	50.4		1	U	50	99.5		MS
Arsenic	ug/L	75-125	50.5		2.53	J	50	95.9		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	100		MS
Chromium	ug/L	75-125	50.5		3	U	50	97.1		MS
Lead	ug/L	75-125	49.4		0.5	U	50	98.6		MS
Molybdenum	ug/L	75-125	53.8		2.55		50	103		MS
Nickel	ug/L	75-125	48.3		0.6	U	50	95.9		MS
Selenium	ug/L	75-125	49.8		2	U	50	99.3		MS
Silver	ug/L	75-125	49		0.3	U	50	98.1		MS
Thallium	ug/L	75-125	47.2		0.6	U	50	94.3		MS
Uranium	ug/L	75-125	49.2		0.915		50	96.6		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1716**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_ESR-17-137413D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 425358001**Duplicate ID:** 1203811042**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1716

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813736

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	12.2		11.8		3.72		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	8810		8640		1.99		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%	2560		2510		2.13		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1520		1560		2.4		P
Silica	ug/L	+/-20%	57300		55800		2.64		P
Sodium	ug/L	+/-20%	14000		13900		.781		P
Strontium	ug/L	+/-20%	59.8		58.4		2.37		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	8.58		8.34		2.83		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1716

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-133330D

Matrix: WATER

Level: Low

Sample ID: 425329003

Duplicate ID: 1203813741

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L	+/-5	2.53 J		2.45 J		3.25		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	+/-20%	2.55		2.58		1.33		MS
Nickel	ug/L		0.6 U		0.6 U				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	0.915		0.883		3.56		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203811041	Mercury	ug/L	2	2.16		108	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203813735								
	Aluminum	ug/L	5000	5240		105	80-120	P
	Barium	ug/L	500	535		107	80-120	P
	Beryllium	ug/L	500	532		106	80-120	P
	Boron	ug/L	500	540		108	80-120	P
	Calcium	ug/L	5000	5280		106	80-120	P
	Cobalt	ug/L	500	531		106	80-120	P
	Copper	ug/L	500	539		108	80-120	P
	Iron	ug/L	5000	5340		107	80-120	P
	Magnesium	ug/L	5000	5380		108	80-120	P
	Manganese	ug/L	500	532		106	80-120	P
	Potassium	ug/L	5000	5400		108	80-120	P
	Silica	ug/L	10700	11100		104	80-120	P
	Sodium	ug/L	5000	5450		109	80-120	P
	Strontium	ug/L	500	525		105	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	535		107	80-120	P
	Zinc	ug/L	500	504		101	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1716

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>
1203813740								
	Thallium	ug/L	50	48.7		97.3	80-120	MS
	Uranium	ug/L	50	49		98	80-120	MS
	Antimony	ug/L	50	49.8		99.6	80-120	MS
	Arsenic	ug/L	50	50.5		101	80-120	MS
	Cadmium	ug/L	50	50.1		100	80-120	MS
	Chromium	ug/L	50	56.2		112	80-120	MS
	Lead	ug/L	50	50.2		100	80-120	MS
	Molybdenum	ug/L	50	50.6		101	80-120	MS
	Nickel	ug/L	50	54		108	80-120	MS
	Selenium	ug/L	50	50.6		101	80-120	MS
	Silver	ug/L	50	50.1		100	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716 **Client ID:** WT_ESR-17-137413L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 425358001 **Serial Dilution ID:** 1203811046

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716

Client ID: CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 425329003

Serial Dilution ID: 1203813738

<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	12.2		12	J	2.237			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	8810		8460		4.014		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2560		2580		.488			P
Manganese	2	U	10	U				P
Potassium	1520		1530		.553			P
Silica	57300		54700		4.583		10	P
Sodium	14000		14500		3.791		10	P
Strontium	59.8		58.9		1.463		10	P
Tin	2.5	U	12.5	U				P
Vanadium	8.58		5.76	J	32.8			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1716 **Client ID:** CAWA-17-133330L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 425329003 **Serial Dilution ID:** 1203813743

<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	2.53	J	10	U	28.346			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.55		2.56		.589			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.915		.885	J	3.279			MS

*Analytical Methods:

MS SW846 3005A/6020A

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1716
Work Order #: 425329**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1673634

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
425329002	CAWA-17-133302
1203812102	Method Blank (MB)
1203812103	Laboratory Control Sample (LCS)
1203812277	Laboratory Control Sample Duplicate (LCSD)
1203812105	425300003(CAWA-17-133305) Sample Duplicate (DUP)
1203812107	425300003(CAWA-17-133305) 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.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

Quality Control (QC) Designation

Sample 425300003 (CAWA-17-133305) 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:	Cyanide and Total		
Analytical Batch:	1673690	Method:	WSP-CN(T)
Prep Batch :	1673689	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
425329002	CAWA-17-133302
1203810623	Method Blank (MB)
1203810624	Laboratory Control Sample (LCS)
1203810625	425300001(CAWA-17-133280) Sample Duplicate (DUP)
1203810627	425300001(CAWA-17-133280) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 19.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

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 425300001 (CAWA-17-133280) 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

Sample1203810624 (LCS) was re-analyzed to verify the result.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1673741 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810741	Method Blank (MB)
1203810742	Laboratory Control Sample (LCS)
1203810743	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203810744	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203810743 (CAWA-17-133314DUP) and 1203810744 (CAWA-17-133314PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203810743 (CAWA-17-133314DUP), 1203810744 (CAWA-17-133314PS) and 425329003 (CAWA-17-133330) 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:	1673875	Method:	NH3
Prep Batch :	1673874	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
425329003	CAWA-17-133330
1203811097	Method Blank (MB)
1203811098	Laboratory Control Sample (LCS)
1203811099	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811100	425079002(CAWA-17-133314) 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+ 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 425079002 (CAWA-17-133314) 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 Kjeldahl Nitrogen		
Analytical Batch:	1673872	Method:	TKN
Prep Batch :	1673870	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
425329002	CAWA-17-133302
1203811089	Method Blank (MB)
1203811090	Laboratory Control Sample (LCS)
1203811091	425079001(CAWA-17-133286) Sample Duplicate (DUP)
1203811092	425079001(CAWA-17-133286) 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 425079001 (CAWA-17-133286) 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

Samples 1203811089 (MB), 1203811090 (LCS), 1203811091 (CAWA-17-133286DUP), 1203811092 (CAWA-17-133286MS) and 425329002 (CAWA-17-133302) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. Sample 425329002 (CAWA-17-133302) was re-analyzed to verify the result.

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: 1673698

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810634	Method Blank (MB)
1203810635	Laboratory Control Sample (LCS)
1203810636	425316001(MD50-17-138988) Sample Duplicate (DUP)
1203810637	425316001(MD50-17-138988) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 425316001 (MD50-17-138988) 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:	1673877	Method:	PO4
Prep Batch :	1673876	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
425329003	CAWA-17-133330
1203811104	Method Blank (MB)
1203811105	Laboratory Control Sample (LCS)
1203811108	425079002(CAWA-17-133314) Sample Duplicate (DUP)
1203811109	425079002(CAWA-17-133314) 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 425079002 (CAWA-17-133314) 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

Samples 1203811104 (MB) and 1203811105 (LCS) were 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:

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: 1673670

Method: TDS

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203810569	Method Blank (MB)
1203810570	Laboratory Control Sample (LCS)
1203810572	425300002(CAWA-17-133308) 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 425300002 (CAWA-17-133308) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1679220

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
425329003	CAWA-17-133330
1203823672	Laboratory Control Sample (LCS)
1203823673	425329003(CAWA-17-133330) 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

Sample 425329003 (CAWA-17-133330) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1675817 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
425329003	CAWA-17-133330
1203815599	Laboratory Control Sample (LCS)
1203815600	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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
1203815600 (CAWA-17-133330DUP)	pH	Received 13-JUN-17, out of holding 08-JUN-17
425329003 (CAWA-17-133330)	pH	Received 13-JUN-17, out of holding 08-JUN-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: 1675815 **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
425329003	CAWA-17-133330
1203815591	Laboratory Control Sample (LCS)
1203815593	425329003(CAWA-17-133330) Sample Duplicate (DUP)
1203815594	425329003(CAWA-17-133330) 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 425329003 (CAWA-17-133330) 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: 2017-1716 GEL Work Order: 425329

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: 07 JUL 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: July 7, 2017

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

Los Alamos, New Mexico 87545

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133302
Sample ID: 425329002
Matrix: W
Collect Date: 08-JUN-17 11:53
Receive Date: 13-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	06/22/17	0604	1673634	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/15/17	1115	1673690	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	06/21/17	1045	1673872	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/15/17	1041	1673689
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	06/19/17	1700	1673870

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 2017

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

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133330
Sample ID: 425329003
Matrix: W
Collect Date: 08-JUN-17 11:53
Receive Date: 13-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/13/17	2357	1673741	1
Chloride		1.67	0.067	0.200	mg/L		1					
Fluoride		0.142	0.033	0.100	mg/L		1					
Sulfate		4.98	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.040	0.017	0.050	mg/L	1.00	1	KLP1	06/15/17	1142	1673875	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.388	0.017	0.050	mg/L		1	AXH3	06/14/17	0854	1673698	3
PO4 "As Received"												
Phosphorus, Total as P		0.0741	0.020	0.050	mg/L	1.00	1	KLP1	06/20/17	1050	1673877	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		117	3.40	14.3	mg/L			KLP1	06/15/17	1544	1673670	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		60.4	1.45	4.00	mg/L			RXB5	06/22/17	1841	1675815	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		172	1.00	1.00	umhos/cm		1	SXM7	07/06/17	0912	1679220	7
PH "As Received"												
pH at Temp 20.1C	H	8.21	0.010	0.100	SU		1	RXB5	06/22/17	1840	1675817	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	06/15/17	0855	1673874
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	06/19/17	1700	1673876

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: July 7, 2017

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

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

Client SDG: 2017-1716

Client Sample ID: CAWA-17-133330
Sample ID: 425329003

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 7, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 425329

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
----------	-----	--------	------	----	-------	------	------	-------	-------	------	------

Carbon Analysis

Batch	1673634										
QC1203812105	425300003	DUP									
Total Organic Carbon Average		1.84		1.82	mg/L	1.15	^	(+/-1.00)	TSM	06/22/17	03:43
QC1203812103	LCS										
Total Organic Carbon Average	10.0			9.81	mg/L			98.1	(80%-120%)	06/21/17	17:57
QC1203812277	LCSD										
Total Organic Carbon Average	10.0			9.89	mg/L	0.873		98.9	(0%-20%)	06/21/17	18:09
QC1203812102	MB										
Total Organic Carbon Average			U	ND	mg/L					06/21/17	17:45
QC1203812107	425300003	PS									
Total Organic Carbon Average	10.0	1.84		11.1	mg/L			92.9	(75%-125%)	06/22/17	04:30

Flow Injection Analysis

Batch	1673690										
QC1203810625	425300001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	06/15/17	11:06
QC1203810624	LCS										
Cyanide, Total	50.0				52.8	ug/L		106	(90%-110%)	06/15/17	11:04
QC1203810623	MB										
Cyanide, Total			U		ND	ug/L				06/15/17	10:57
QC1203810627	425300001	MS									
Cyanide, Total	100	U	ND		110	ug/L		110	(90%-110%)	06/15/17	11:07

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
QC1203810743	425079002	DUP									
Bromide	J	0.0867	J	0.0848	mg/L	2.22	^	(+/-0.200)	MXL2	06/13/17	21:03
Chloride		13.8		13.8	mg/L	0.084		(0%-20%)		06/14/17	14:46
Fluoride		0.171		0.169	mg/L	1	^	(+/-0.100)		06/13/17	21:03
Sulfate		6.08		5.94	mg/L	2.35		(0%-20%)			
QC1203810742	LCS										
Bromide	1.25			1.26	mg/L		101	(80%-120%)		06/13/17	20:06
Chloride	5.00			4.72	mg/L		94.3	(80%-120%)			
Fluoride	2.50			2.45	mg/L		97.9	(80%-120%)			
Sulfate	10.0			9.78	mg/L		97.8	(80%-120%)			
QC1203810741	MB										
Bromide			U	ND	mg/L					06/13/17	19:37
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203810744	425079002	PS									
Bromide	1.25	J	0.0867	1.31	mg/L		97.8	(75%-125%)		06/13/17	21:32
Chloride	5.00		6.91	12.4	mg/L		110	(75%-125%)		06/14/17	15:15

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1673741										
Fluoride	2.50	0.171		2.57	mg/L		96	(75%-125%)	MXL2	06/13/17	21:32
Sulfate	10.0	6.08		16.3	mg/L		102	(75%-125%)			
Nutrient Analysis											
Batch	1673698										
QC1203810636	425316001	DUP									
Nitrogen, Nitrate/Nitrite		0.593		0.595	mg/L	0.337		(0%-20%)	AXH3	06/14/17	08:52
QC1203810635	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.980	mg/L		98	(90%-110%)		06/14/17	08:49
QC1203810634	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/14/17	08:48
QC1203810637	425316001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.593		1.55	mg/L		95.7	(90%-110%)		06/14/17	08:53
Batch	1673872										
QC1203811091	425079001	DUP									
Nitrogen, Total Kjeldahl		U	ND	J	0.038	mg/L	200		KLP1	06/21/17	09:54
QC1203811090	LCS										
Nitrogen, Total Kjeldahl	1.00			1.10	mg/L		110	(90%-110%)		06/21/17	09:50
QC1203811089	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					06/21/17	09:50
QC1203811092	425079001	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.974	mg/L		97.4	(90%-110%)		06/21/17	09:55
Batch	1673875										
QC1203811099	425079002	DUP									
Nitrogen, Ammonia		0.0967		0.0902	mg/L	6.96	^	(+/-0.050)	KLP1	06/15/17	11:36

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1673875										
QC1203811098	LCS										
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)	KLP1	06/15/17	11:28
QC1203811097	MB										
Nitrogen, Ammonia			U	ND	mg/L					06/15/17	11:27
QC1203811100	425079002	MS									
Nitrogen, Ammonia	1.00	0.0967		1.03	mg/L		93.3	(90%-110%)		06/15/17	11:37
Batch	1673877										
QC1203811108	425079002	DUP									
Phosphorus, Total as P		0.0742		0.0979	mg/L	27.5	^	(+/-0.050)	KLP1	06/20/17	10:29
QC1203811105	LCS										
Phosphorus, Total as P	1.00			0.975	mg/L		97.5	(80%-124%)		06/20/17	10:38
QC1203811104	MB										
Phosphorus, Total as P			J	0.0324	mg/L					06/20/17	10:38
QC1203811109	425079002	MS									
Phosphorus, Total as P	1.00	0.0742		1.23	mg/L		116	(63%-139%)		06/20/17	10:30
Solids Analysis											
Batch	1673670										
QC1203810572	425300002	DUP									
Total Dissolved Solids		121		123	mg/L	1.17		(0%-5%)	KLP1	06/15/17	15:44
QC1203810570	LCS										
Total Dissolved Solids	300			296	mg/L		98.6	(95%-105%)		06/15/17	15:44
QC1203810569	MB										
Total Dissolved Solids			U	ND	mg/L					06/15/17	15:44

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1675815										
QC1203815593	425329003	DUP									
Alkalinity, Total as CaCO3		60.4		60.6	mg/L	0.331		(0%-20%)	RXB5	06/22/17	18:42
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203815591	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		06/22/17	18:02
QC1203815594	425329003	MS									
Alkalinity, Total as CaCO3	100	60.4		165	mg/L		105	(80%-120%)		06/22/17	18:43
Batch	1675817										
QC1203815600	425329003	DUP									
pH	H	8.21	H	8.19	SU	0.244		(0%-5%)	RXB5	06/22/17	18:42
QC1203815599	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		06/22/17	18:25
Batch	1679220										
QC1203823673	425329003	DUP									
Conductivity		172		172	umhos/cm	0		(0%-10%)	SXM7	07/06/17	09:16
QC1203823672	LCS										
Conductivity	1410			1370	umhos/cm		96.7	(95%-105%)		07/06/17	09:05

- Notes:**
- < Result is less than value reported
 - > Result is greater than value reported
 - B The target analyte was detected in the associated blank.
 - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
 - H Analytical holding time was exceeded
 - J Value is estimated
 - N/A RPD or %Recovery limits do not apply.
 - N1 See case narrative

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425329

Page 6 of 6

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

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

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

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

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

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