

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 228.

[illegible]

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAPA-17-133354

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	6/11/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1335		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-18		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / (NA)

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

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

## FIELD PARAMETERS:

Sample Time NA HH:MMCOLLECTED BY (PRINT): A. Vasil

RELINQUISHED BY (Printed Name) <u>ANNE W UGIL</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/11/17</u> <u>1650</u>	RECEIVED BY (Printed Name) <u>S. Sherwood</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/11/17</u> <u>1650</u>
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: CAPA-17-133356

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	6/1/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1335		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-18		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	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: generator Running at about 50' away.

LOCATION COMMENTS: PH = 7.66 SV Temp = 16.8°C spec Cond = 115.3 µs/cm DO = 5.84 mg/L

FIELD PARAMETERS: Turb = 0.33 NTU ORP = 149.8 mV GPM = 6.97 gpm

Sample Time NA HH:MM

COLLECTED BY (PRINT): A. Vogel

RELINQUISHED BY (Printed Name) Andrew Vogel (Signature) <i>Andrew Vogel</i>	Date/Time 6/1/17 1650	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 6/1/17 1650
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAPA-17-133363

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	6/11/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1335		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	68P	
LOCATION ID:	R-18		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FB	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	✓
BOTTOM DEPTH:	NA	✓	EXCAVATED:		YES / NO <input checked="" type="radio"/>

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

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time NA HH:MM

COLLECTED BY (PRINT): A. Vigil

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) <i>Andrew Vigil</i>	Date/Time 6/11/17 1650	RECEIVED BY <i>Sherwood</i> (Printed Name) <i>Sherwood</i> (Signature) <i>Sherwood</i>	Date/Time 6/11/17 1650
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: CAPA-17-133364

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	6/1/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1335		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-18		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	✓
BOTTOM DEPTH:	NA	↓	EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2 MS still 17	HCL	y	NA

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time NA HH:MM

COLLECTED BY (PRINT): A. Vigil

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) [Signature]	Date/Time 6/1/17 1650	RECEIVED BY (Printed Name) S. Sherwood (Signature) [Signature]	Date/Time 6/1/17 1650
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. 2017-1645

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424739	EPA:120.1	1				
424739	EPA:150.1	1				
424739	EPA:160.1	1				
424739	EPA:170.0	2		1	1	
424739	EPA:245.2	2				
424739	EPA:300.0	1				
424739	EPA:310.1	1				
424739	EPA:335.4	1				
424739	EPA:350.1	1				
424739	EPA:351.2	1				
424739	EPA:353.2	1				
424739	EPA:365.4	1				
424739	SM:A2340B	1				
424739	SW-846:6010C	1				
424739	SW-846:6020	1				
424739	SW-846:6850	1				
424739	SW-846:8260B	1		1	1	
424739	SW-846:8330B	1				
424739	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
424739	EPA:120.1	1671823	1671823	1										1				2			
424739	EPA:150.1	1671988	1671988	1										1				2			
424739	EPA:160.1	1671665	1671665	1					1					1				1			
424739	EPA:170.0	NA	NA	2		1	1														
424739	EPA:245.2	1673477	1673474	2					1	2				1				2			

## 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
424739	EPA:300.0	1671680	1671680	1					1					1			1				
424739	EPA:310.1	1671987	1671987	1						1				2			1				
424739	EPA:335.4	1671534	1671533	1					1	1				1			1				
424739	EPA:350.1	1671935	1671933	1					1	1				1			1				
424739	EPA:351.2	1671942	1671941	1					1	1				1			1				
424739	EPA:353.2	1671832	1671832	1					1					1			2				
424739	EPA:365.4	1671937	1671936	1					1	1				1			1				
424739	SM:A2340B	1677435	1677435	1																	
424739	SW-846:6010C	1671565	1671563	1					1	1				1			1				
424739	SW-846:6020	1671589	1671587	1					1	1				1			1				
424739	SW-846:6850	1671834	1671833	1					1	1	1			1							
424739	SW-846:8260B	1671196	1671196	1		1	1		4					7							
424739	SW-846:8330B	1671746	1671745	1					1	1	1			1							
424739	SW-846:9060	1671529	1671529	1					1					1	1		1				

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133306	1203805835	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133332	1203805836	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203805834	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133306	1203806296	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806297	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203806295	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-17133354	1203805324	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203805323	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203805322	MB	1	0	0	0
EPA:170.0	VOC	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-17-133356	424739002	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	CAPA-17-133363	424739003	FB	1	0	0	0
EPA:170.0	VOC	CAPA-17-133364	424739004	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-133356	424739002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810088	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810090	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810087	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810089	MS	0	0	1	0
EPA:245.2	INORGANIC	LCS	1203810086	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203810085	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-134176	1203805355	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203805354	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203805353	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806285	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806287	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203806283	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203808726	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17-133356	424739002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805010	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805012	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203805009	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203805008	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806103	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806104	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203806102	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203806101	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806128	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806129	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133356	424739002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203806127	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203806126	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-17-133354	424739001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-134176	1203805866	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203805864	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203805863	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	MSGP-17-132059	1203805867	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-17-133354	424739001	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	CAWA-17-134176	1203806120	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	1203806121	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203806113	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203806112	MB	1	0	0	0
SM:A2340B	INORGANIC	CAPA-17-133354	424739001	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805073	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805074	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPA-17-133354	424739001	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203805072	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203805071	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805128	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805129	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-17-133354	424739001	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203805127	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203805126	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805877	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805878	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133354	424739001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203805876	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203805875	MB	1	0	0	0
SW-846:8260B	VOC	CAPA-17-133356	424739002	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-17-133363	424739003	FB	80	3	0	0
SW-846:8260B	VOC	CAPA-17-133364	424739004	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203804344	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203804345	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806304	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806305	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806750	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806751	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203807986	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203804343	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806303	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806749	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203807982	MB	80	3	0	0
SW-846:8330B	LCMS/MS HIGH	CAPA-17-133356	424739002	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805559	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805560	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203805556	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17-133356	424739002	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
SW-846:9060	GENERAL CHEMISTRY	CAPA-17133356	1203805984	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203805982	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	LCSD	1203805983	LCSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203805981	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	1203805071	METHOD BLANK	SW-846:6010C	W	Zinc	-4.22	J	ug/L	10.0
MB	1203806101	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0385	J	mg/L	0.050
MB	1203806126	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0715	J	mg/L	0.100

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
CAPA-17-133354	1203806101	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0385	mg/L	0.0939		0.050	Y	5	100	Y
CAPA-17-133356	1203806126	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0715	mg/L	0.154		0.100	Y	5	100	Y
CAPA-17-133354	1203805071	METHOD BLANK	SW-846:6010C	Zinc	-4.22	ug/L	10.0	U	10.0	N			

## 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?

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203805556		SW-846:8330B	Dinitrotoluene[2,6-]	1671745	06-09-2017	W	106		105	72				
1203805556		SW-846:8330B	TATB	1671745	06-09-2017	W	150		135	47				

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field Sample ID	Lab Sample ID	LD Lab Sample ID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	LD Lab Result	Lab Units	Detect Flag	LD Detect Flag	RPD	RPD Limit
CAPA-17-133354	424739001	1203805324	EPA:160.1	Total Dissolved	W	149	130	mg/L	Y	Y	13.3	5

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.



## DATA VALIDATION REPORT

### 13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-18	2017-1645	CAPA-17-133354	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.0939	mg/L	0.0939	mg/L			W	06/01/2017		1671935	VAL	Y
R-18	2017-1645	CAPA-17-133354	REG	INIT	GENERAL CHEMISTRY	EPA:160.1	Total Dissolved Solids		U	I10b	Y	149	mg/L	149	mg/L			W	06/01/2017		1671665	VAL	Y
R-18	2017-1645	CAPA-17-133356	REG	INIT	VOC	SW-846:8260B	Methylene Chloride	J	U	V4d	N	1.64	ug/L	1.64	ug/L			W	06/01/2017		1671196	VAL	Y
R-18	2017-1645	CAPA-17-133356	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen		U	I4	N	0.154	mg/L	0.154	mg/L			W	06/01/2017		1671942	VAL	Y

### Reason Code

### Description

I10b	The sample and/or the duplicate sample results RPD is not within the acceptance limits. Follow the external laboratory limits located within the associated data package
I4	the sample result is =<5x the concentration of related analyte in the method blank.
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.
V4d	The samples result is </=5x the concentration of the related analyte in the trip, rinsate and/or equipment blank.

### 14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-133354	R-18	REG	EPA:120.1	0	1
CAPA-17-133354	R-18	REG	EPA:150.1	0	1
CAPA-17-133354	R-18	REG	EPA:160.1	0	1
CAPA-17-133354	R-18	REG	EPA:170.0	0	1
CAPA-17-133354	R-18	REG	EPA:245.2	0	1
CAPA-17-133354	R-18	REG	EPA:300.0	0	4
CAPA-17-133354	R-18	REG	EPA:310.1	0	2
CAPA-17-133354	R-18	REG	EPA:350.1	0	1
CAPA-17-133354	R-18	REG	EPA:353.2	0	1
CAPA-17-133354	R-18	REG	EPA:365.4	0	1
CAPA-17-133354	R-18	REG	SM:A2340B	0	1
CAPA-17-133354	R-18	REG	SW-846:6010C	0	17

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-133354	R-18	REG	SW-846:6020	0	11
CAPA-17-133354	R-18	REG	SW-846:6850	0	1
CAPA-17-133356	R-18	REG	EPA:170.0	0	1
CAPA-17-133356	R-18	REG	EPA:245.2	0	1
CAPA-17-133356	R-18	REG	EPA:335.4	0	1
CAPA-17-133356	R-18	REG	EPA:351.2	0	1
CAPA-17-133356	R-18	REG	SW-846:8260B	0	80
CAPA-17-133356	R-18	REG	SW-846:8330B	0	20
CAPA-17-133356	R-18	REG	SW-846:9060	0	1
CAPA-17-133363	R-18	FB	EPA:170.0	0	1
CAPA-17-133363	R-18	FB	SW-846:8260B	0	80
CAPA-17-133364	R-18	FTB	EPA:170.0	0	1
CAPA-17-133364	R-18	FTB	SW-846:8260B	0	80

## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1645 - Rev

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424739	SW-846:8330B	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
424739	SW-846:8330B	1671746	1671745	1					1												

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	CAPA-17-133356	424739002	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	3	0	0	0

### 3. Are any analytes missing?

No.

### 4. Were any holding times exceeded?

No.

### 5. Any contaminants in blanks?

No.

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

## DATA VALIDATION REPORT

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

### **Reason Code**

### **Description**

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
-----------------	-------------	----------------	-------------------	-----------------------	---------------



## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-133356	R-18	REG	SW-846:8330B	0	3

June 26, 2017

[gel.com](http://gel.com)

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

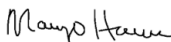
Re: LANL- WQH Water Samples  
Work Order: 424739  
SDG: 2017-1645

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 06, 2017, and analyzed for Explosives by LCMSMS, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1645  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 424739**  
**SDG: 2017-1645**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 424739  
SDG # : 2017-1645**

**June 26, 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 06, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

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

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
424739001	CAPA-17133354
424739002	CAPA-17133356
424739003	CAPA-17133363
424739004	CAPA-17133364

**Case Narrative**

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

**Data Package**

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

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

*Margo Herron*  
Margo Herron for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 26 June 2017**

<b>State</b>	<b>Certification</b>
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**







Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424739</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/6/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1782 1683 - 4°C</u> <u>5908 1782 1672 - 4°C</u> <u>5908 1782 1650 - 3°C</u> <u>5908 1782 1694 - 4°C</u> <u>5908 1782 1709 - 5°C</u> <u>5908 1782 1640 - 5°C</u> <u>5908 1782 1661 - 5°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> / mR/Hr Classified as: Rad 1    Rad 2    Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's    Flammable    Foreign Soil    RCRA    Asbestos    Beryllium    Other: _____	
Sample Receipt Criteria		Yes	NA
1 Shipping containers received intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Chain of custody documents included with shipment?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5 Sample containers intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7 Do any samples require Volatile Analysis?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8 Samples received within holding time?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9 Sample ID's on COC match ID's on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10 Date & time on COC match date & time on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11 Number of containers received match number indicated on COC?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
12 Are sample containers identifiable as GEL provided?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13 COC form is properly signed in relinquished/received sections?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed): <u>* We also rec'd 2 VOA vials for CAWA-17-13394 not indicated on the CoC.</u> <u>* We only rec'd 1 VOA vial for WASTMO-17-136839</u>			

PM (or PMA) review: Initials

MEH

Date

6/7/17

Page

1of 1

GL-CHL-SR-001 Rev 5

ORIGIN ID: SAFA (505) 865-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 05JUN17  
ACTWGT: 51.0 LB MAN  
CAD: 0014176/CAFE2916

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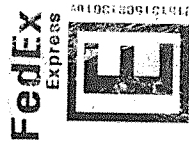
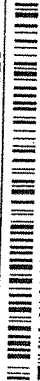
TO VALERIE DAVIS

GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



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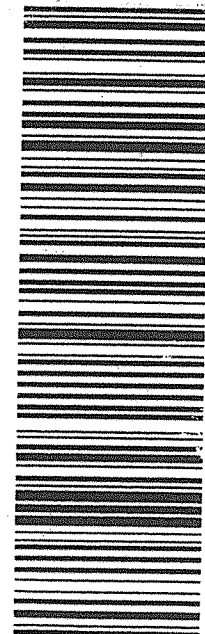
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Mstr# 5908 1782 1640

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 R1T2 08/15 33

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

SHIP DATE: 05JUN17  
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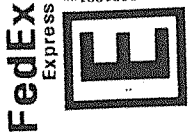
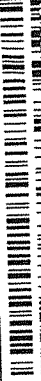
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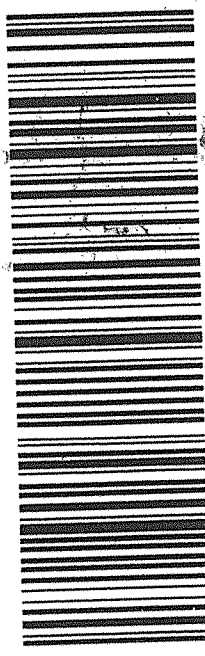
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## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 R1T2 08/15 33

538C1/A502/329B

4c

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: 05JUN17  
ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2916

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

LOS ALAMOS, NM 87545  
UNITED STATES US

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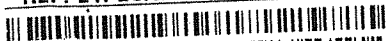
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(843) 556-8171

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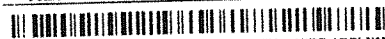


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1 of 2  
TRK# 5908 1782 1640  
0201

## MASTER ##

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PRIORITY OVERNIGHT

2940  
SC-US CH



2 of 2  
MPS# 5908 1782 1672  
0263

Mstr# 5908 1782 1661

0201

X7 RBWA

2940  
SC-US CH



SHIP DATE: 05JUN17  
ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

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

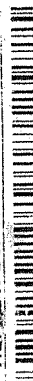
LOS ALAMOS, NM 87545  
UNITED STATES US

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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

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REF: 21PD0ASRGW04BAGWE0



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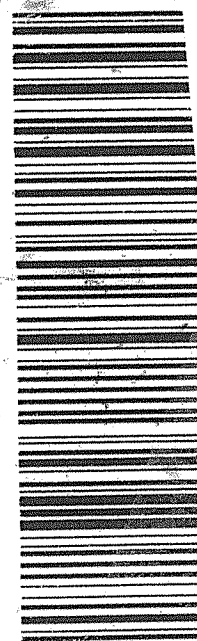
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X7 RBWA

29407  
SC-US CHS



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ACTWT: 56.0 LB 14.00  
CRD: 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: 21PD0ASRGW04BAGWE0



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Express

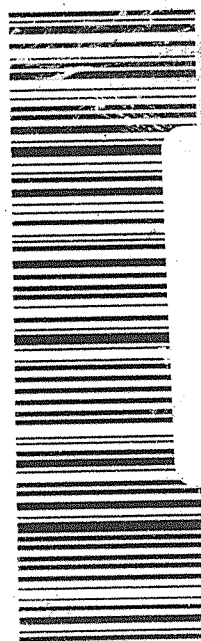


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PRIORITY OVERNIGHT

TRK# 5908 1782 1709

X7 RBWA

29407  
SC-US CHS



RT 257 5 E 10:30 1709 06.06  
ST F1

Part # 156148V-434 RIT2 06/15 30

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: 21PD0ASRGW04BAGWE0



FedEx  
Express

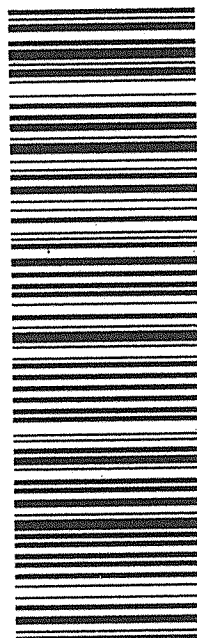


TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

1 of 2  
TRK# 5908 1782 1661  
0201  
## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 30



# **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 #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1671196

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
424739003	CAPA-17133363
424739004	CAPA-17133364
1203804346	424596006(CAWA-17-134191) Post Spike (PS)
1203804347	424596006(CAWA-17-134191) Post Spike (PS)
1203804348	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203804349	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203806749	Method Blank (MB)
1203806750	Laboratory Control Sample (LCS)
1203806751	Laboratory Control Sample (LCS)
1203807982	Method Blank (MB)
1203807986	Laboratory Control Sample (LCS)

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

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

**SOP Reference**

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

**Calibration Information**

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

industry shortage.

#### **Initial Calibration**

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

#### **Continuing Calibration Verification Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

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

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

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

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

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

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

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

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

#### **Technical Information**

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

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

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

All samples met the sample preservation and integrity requirements.

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

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

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

##### **Manual Integrations**

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

manual integrations.

#### **TIC Comment**

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Residual Chlorine**

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

#### **Electronic Package Comment**

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

#### **System Configuration**

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

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

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

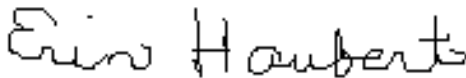
#### The Qualifiers in this report are defined as follows:

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

#### Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 25 JUN 2017

Title: Data Validator

# **Sample Data Summary**

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

SDG Number: 2017-1645

Lab Sample ID: 424739002

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133356

Batch ID: 1671196

Run Date: 06/08/2017 14:42

Prep Date: 06/08/2017 14:42

Data File: 060817V4\4L414.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: 2017-1645

Lab Sample ID: 424739002

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133356

Batch ID: 1671196

Run Date: 06/08/2017 14:42

Prep Date: 06/08/2017 14:42

Data File: 060817V4\4L414.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.64	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: 2017-1645

Lab Sample ID: 424739002

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133356

Batch ID: 1671196

Run Date: 06/08/2017 14:42

Prep Date: 06/08/2017 14:42

Data File: 060817V4\4L414.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	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	49.0	50.0	ug/L 98	(74%-124%)

## Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.403	7.07	ug/L	0	J
	unknown siloxane	12.205	5.3	ug/L	0	J
	unknown siloxane	14.576	7.8	ug/L	0	J

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

SDG Number: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.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: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.82	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: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.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	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	54.5	50.0	ug/L 109	(70%-131%)
Toluene-d8	49.4	50.0	ug/L 99	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	6.56	ug/L	0	J
	unknown siloxane	14.576	12.3	ug/L	0	J

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 15:39

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 15:39

Data File: 060817V4\4L416.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: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 15:39

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 15:39

Column: DB-624

Data File: 060817V4\4L416.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.95	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: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133364

Batch ID: 1671196

Run Date: 06/08/2017 15:39

Prep Date: 06/08/2017 15:39

Data File: 060817V4\4L416.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	52.5	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	48.3	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	8.8	ug/L	0	J
	unknown siloxane	14.576	15.8	ug/L	0	J

# **Quality Control Summary**



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

Page 1 of 1

**SDG Number: 2017-1645****Matrix Type: LIQUID**

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Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203806750	LCS for batch 1671196	101	101	108
1203806751	LCS for batch 1671196	109	102	113
1203806749	MB for batch 1671196	106	101	111
424739002	CAPA-17133356	102	98	106
424739003	CAPA-17133363	106	99	109
424739004	CAPA-17133364	105	97	106
1203804346	CAWA-17-134191PS	90	98	99
1203804348	CAWA-17-134191PSD	98	100	100
1203807986	LCS for batch 1671196	102	98	109
1203807982	MB for batch 1671196	97	98	109
1203804347	CAWA-17-134191PS	97	94	105
1203804349	CAWA-17-134191PSD	96	94	106

**Surrogate****Acceptance Limits**

DCED4	= 1,2-Dichloroethane-d4	(71%-134%)
TOL	= Toluene-d8	(74%-124%)
BFB	= Bromofluorobenzene	(70%-131%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	87.0	87	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	832	67	56-131
67-64-1	PS Acetone	250	0.00 U	96.3	39	25-155
74-88-4	PS Iodomethane	250	0.00 U	196	78	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	201	80	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	220	88	48-133
78-93-3	PS 2-Butanone	250	0.00 U	127	51	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	175	70	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	158	63	33-138
75-09-2	PS Methylene chloride	50.0	1.24 J	38.0	73	62-123
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	38.6	77	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.4	89	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.2	96	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.2	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.1	92	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.0	92	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	47.5	95	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	38.9	78	59-130
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	37.6	75	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	41.5	83	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	39.9	80	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	40.5	81	71-130
67-66-3	PS Chloroform	50.0	0.00 U	40.5	81	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	39.8	80	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	39.6	79	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	41.8	84	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	40.3	81	69-130
71-43-2	PS Benzene	50.0	0.00 U	40.0	80	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	41.0	82	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	41.5	83	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	39.8	80	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	42.2	84	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	40.3	81	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.0	82	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	42.5	85	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	39.3	79	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	39.4	79	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	40.8	82	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	37.6	75	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	40.1	80	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	41.0	82	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.8	86	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	44.4	89	62-131
100-42-5	PS Styrene	50.0	0.00 U	46.1	92	59-135
75-25-2	PS Bromoform	50.0	0.00 U	41.6	83	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	42.4	85	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	37.1	74	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	36.7	73	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	40.9	82	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	42.2	84	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	44.2	88	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	42.3	85	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	41.4	83	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	43.8	88	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	43.3	87	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	44.1	88	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	44.6	89	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	40.8	82	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	40.2	80	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	43.0	86	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	31.0	62	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	39.3	79	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	38.0	76	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	38.8	78	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	37.3	75	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	43.9	88	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	40.4	81	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	3980	80	60-140

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00 U	84.4	84	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	975	78	56-131	16	0-20
67-64-1	PSD Acetone	250	0.00 U	112	45	25-155	15	0-20
74-88-4	PSD Iodomethane	250	0.00 U	198	79	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	198	79	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	239	95	48-133	8	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	148	59	25-143	15	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	201	81	61-127	14	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	178	71	33-138	12	0-20
75-09-2	PSD Methylene chloride	50.0	1.24 J	38.8	75	62-123	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	40.6	81	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	44.1	88	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	48.6	97	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	44.3	89	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	46.4	93	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	45.2	90	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.0	102	69-127	7	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	38.8	78	59-130	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	40.6	81	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	41.1	82	69-127	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	39.2	78	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	40.9	82	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	39.9	80	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	39.7	79	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	38.6	77	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	40.8	82	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	41.8	84	69-130	4	0-20
71-43-2	PSD Benzene	50.0	0.00 U	39.2	78	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	41.1	82	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	41.3	83	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	42.2	84	72-129	6	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	42.8	86	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	41.7	83	70-134	3	0-20
108-88-3	PSD Toluene	50.0	0.00 U	40.2	80	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	43.4	87	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	41.7	83	66-125	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	41.3	83	67-124	5	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	40.1	80	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	38.7	77	68-143	3	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	42.1	84	71-127	5	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	40.5	81	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	41.5	83	61-130	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	43.4	87	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	45.7	91	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	43.8	88	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	40.0	80	55-133	6	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	39.2	78	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	38.1	76	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	40.3	81	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	40.3	81	50-133	5	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	42.4	85	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	39.7	79	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	42.4	85	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	41.7	83	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	42.1	84	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	43.0	86	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	39.6	79	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	39.4	79	55-125	2	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	41.3	83	43-142	4	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	36.4	73	62-141	16	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	38.9	78	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	43.2	86	62-134	13	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	41.0	82	52-135	6	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	39.1	78	50-133	5	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	44.2	88	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	40.0	80	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4640	93	60-140	15	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804347

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:30

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804349

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:59

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	88.8	89	71-127
75-05-8	LCS Acetonitrile	1250	0.0	948	76	61-125
67-64-1	LCS Acetone	250	0.0	263	105	48-157
74-88-4	LCS Iodomethane	250	0.0	210	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	213	85	69-138
108-05-4	LCS Vinyl acetate	250	0.0	245	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	226	90	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	208	83	66-124
591-78-6	LCS 2-Hexanone	250	0.0	246	98	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	45.6	91	40-160
74-87-3	LCS Chloromethane	50.0	0.0	39.4	79	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	44.0	88	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.6	93	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.4	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	53.8	108	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.4	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.8	88	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	38.9	78	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	43.0	86	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.3	89	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	44.0	88	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	47.8	96	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.2	84	76-125
67-66-3	LCS Chloroform	50.0	0.0	43.9	88	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.0	88	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.3	95	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	42.7	85	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.9	92	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.6	85	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	42.8	86	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	45.2	90	78-131
108-88-3	LCS Toluene	50.0	0.0	43.1	86	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.1	94	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	42.9	86	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.0	84	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	42.5	85	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.6	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	44.0	88	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.3	85	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.5	89	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.2	92	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.3	93	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.7	83	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	41.5	83	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	43.2	86	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	44.9	90	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.5	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	43.7	87	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.5	89	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.5	93	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.2	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.0	92	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.2	94	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	42.4	85	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	42.3	85	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	39.5	79	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	45.7	91	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	42.5	85	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	46.3	93	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.7	85	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4640	93	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806751

Instrument: VOA4.I

Analysis Date: 06/08/2017 10:50

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	291	116	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	248	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	256	102	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	259	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	264	106	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	257	103	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2650	106	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.9	84	66-147



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203807986

Instrument: VOA4.I

Analysis Date: 06/09/2017 14:13

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	279	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	238	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	251	100	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	264	106	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	266	106	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2710	108	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	42.3	85	66-147

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1645	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060817V4\4L407.D
Lab Sample ID:	1203806749	Prep Date:	06/08/2017 11:19	Analyzed:	06/08/17 11:19
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1671196	1203806750	060817V4\4L403A.D	06/08/17	0924
02 LCS for batch 1671196	1203806751	060817V4\4L406A.D	06/08/17	1050
03 CAPA-17133356	424739002	060817V4\4L414.D	06/08/17	1442
04 CAPA-17133363	424739003	060817V4\4L415.D	06/08/17	1510
05 CAPA-17133364	424739004	060817V4\4L416.D	06/08/17	1539
06 CAWA-17-134191PS	1203804346	060817V4\4L420.D	06/08/17	1735
07 CAWA-17-134191PSD	1203804348	060817V4\4L421.D	06/08/17	1804

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1645	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060917V4\4L508.D
Lab Sample ID:	1203807982	Prep Date:	06/09/2017 14:42	Analyzed:	06/09/17 14:42
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
09 LCS for batch 1671196	1203807986	060917V4\4L507A.D	06/09/17	1413
10 CAWA-17-134191PS	1203804347	060917V4\4L524.D	06/09/17	2230
11 CAWA-17-134191PSD	1203804349	060917V4\4L525.D	06/09/17	2259

# Quality Control Data

**Volatile  
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Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

**Volatile  
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Sample Summary**

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

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

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

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



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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

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

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804347</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:30</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:30</b>				
<b>Data File:</b>	<b>060917V4\4L524.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

**Volatile  
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Sample Summary**

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<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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



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

SDG Number: 2017-1645

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

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

SDG Number: 2017-1645

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203806749		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 11:19	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 11:19		
<b>Data File:</b> 060817V4\4L407.D	<b>Column:</b> DB-624	

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

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

**Tentatively Identified Compound Summary**

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

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

SDG Number: 2017-1645

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		46.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		42.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		41.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		42.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		39.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		44.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		42.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		226	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		43.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		246	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		208	ug/L	1.50	5.00
67-64-1	Acetone		263	ug/L	1.50	10.0
75-05-8	Acetonitrile		948	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		42.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806750</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 09:24</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 09:24</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060817V4\4L403A.D</b>	<b>Column:</b>	<b>DB-624</b>

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

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

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

<b>SDG Number:</b> 2017-1645		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203806751			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/08/2017 10:50	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/08/2017 10:50			
<b>Data File:</b> 060817V4\4L406A.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		256	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806751</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 10:50</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 10:50</b>		
<b>Data File:</b>	<b>060817V4\4L406A.D</b>	<b>Column:</b>	<b>DB-624</b>
		<b>Project:</b>	<b>QC</b>
		<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
		<b>Dilution:</b>	<b>1</b>
		<b>Purge Vol:</b>	<b>5 mL</b>

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



**Volatile  
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Sample Summary**

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<b>SDG Number:</b>	2017-1645	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806751		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 10:50	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 10:50		
<b>Data File:</b>	060817V4\4L406A.D	<b>Column:</b>	DB-624

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

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

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

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807982		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:42		
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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  
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Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203807982</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/09/2017 14:42</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/09/2017 14:42</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060917V4\4L508.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.21	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807982		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:42		
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624	

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

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

**Tentatively Identified Compound Summary**

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 1203807986

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/09/2017 14:13

Prep Date: 06/09/2017 14:13

Data File: 060917V4\4L507A.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		42.3	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		279	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		251	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1645		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807986			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:13			
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624		

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

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203807986	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1
<b>Prep Date:</b> 06/09/2017 14:13	<b>Purge Vol:</b> 5 mL
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624

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

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

# **Perchlorates by LCMSMS Analysis**



# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1645  
Work Order #: 424739**

**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: 1671834

Prep Batch Number: 1671833

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
424739001	424739001 (CAPA-17133354)
1203805879	Interference Check Sample (ICS)
1203805875	Method Blank (MB)
1203805876	Laboratory Control Sample (LCS)
1203805877	424741001(CAPA-17-133353) Matrix Spike (MS)
1203805878	424741001(CAPA-17-133353) 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 424741001 (CAPA-17-133353) was chosen for matrix spike and matrix spike duplicate analysis.

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

The MS recoveries were within the established acceptance limits.

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

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

##### **Internal Standard Area Acceptance**

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

##### **Retention Time**

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

#### **Technical Information**

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

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

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

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

**Manual Integrations**

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

**Method Comments**

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

**Additional Comments**

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

**Perchlorate Isotope Ratio**

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

**System Configuration**

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

**Electronic Packaging Comment**

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

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

### **Chromatographic Columns**

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

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

Dionex: IonPac AG-16 2 x 50 mm.

### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

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

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

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 14 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17133354Date Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 424739001Date Filtered: 07-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	0.261	ug/L		1	07-JUN-17 18:41	per0607018a
	Perchlorate Isotope Ratio			2.98			1	07-JUN-17 18:41	per0607018a
14797-73-0	Perchlorate-101	.05	.2	0.248	ug/L		1	07-JUN-17 18:41	per0607018a
	Perchlorate-O(18)			0.438	ug/L		1	07-JUN-17 18:41	per0607018a

^ 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):** 2017-1645

**Extract Batch Code:** 1671833

**Date Filtered:** 07-JUN-17

**Matrix:** WATER

**Sample ID:** 1203805876

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.209	ug/L	104		85 - 115
Perchlorate Isotope Ratio		2.99				-
Perchlorate-101	0.200	.197	ug/L	99		85 - 115
Perchlorate-O(18)		.47	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):** 2017-1645

**Extract Batch Code:** 1671833

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

**GEL MS/PS ID:** 1203805877

**Client ID:** CAPA-17-133353

**GEL MSD/PSD ID:** 1203805878

**QC Type:** MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.634	ug/L	0.874	120	.806	86	8	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		3.08		2.97		3		-
Perchlorate-101	0.200	0.597	ug/L	0.801	102	.766	85	5	30	75 - 125
Perchlorate-O(18)	0	0.453	ug/L	0.435		.446		3		-

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805875Date Filtered: 07-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	07-JUN-17 17:56	per0607013a
	Perchlorate Isotope Ratio						1	07-JUN-17 17:56	per0607013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate-O(18)			0.465	ug/L		1	07-JUN-17 17:56	per0607013a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805876Date Filtered: 07-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	0.209	ug/L		1	07-JUN-17 18:05	per0607014a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 18:05	per0607014a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	07-JUN-17 18:05	per0607014a
	Perchlorate-O(18)			0.470	ug/L		1	07-JUN-17 18:05	per0607014a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805879Date Filtered: 07-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	0.199	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate Isotope Ratio			2.89			1	07-JUN-17 18:14	per0607015a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate-O(18)			0.504	ug/L		1	07-JUN-17 18:14	per0607015a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDate Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805877Date Filtered: 07-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	0.874	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate Isotope Ratio			3.08			1	07-JUN-17 18:59	per0607020a
14797-73-0	Perchlorate-101	.05	.2	0.801	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate-O(18)			0.435	ug/L		1	07-JUN-17 18:59	per0607020a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDDate Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805878Date Filtered: 07-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	0.806	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate Isotope Ratio			2.97			1	07-JUN-17 19:08	per0607021a
14797-73-0	Perchlorate-101	.05	.2	0.766	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate-O(18)			0.446	ug/L		1	07-JUN-17 19:08	per0607021a

^ 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 #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1671746

Prep Batch Number: 1671745

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) Matrix Spike Duplicate (MSD)

**Preparation/Analytical Method Verification**

**SOP Reference**

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

**Calibration Information**

**Initial Calibration**

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

**Calibration Verification Standard Requirements**

All calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB) and 424739002 (CAPA-17133356) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

**Calibration Blank Requirements**

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may

have a concentration for target analytes in the Found column. These values should be zero.

#### **CRI Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

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

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

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

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

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

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

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

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

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

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

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

#### **Technical Information**

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

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

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

All procedures were performed as stated in the SOP.

#### **Sample Dilutions**

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

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

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

#### **Miscellaneous Information**

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

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

##### **Manual Integrations**

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

##### **Additional Comments**

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

#### **System Configuration**

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

#### **Electronic Packaging Comment**

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

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

#### **Chromatographic Columns**

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

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

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

**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

#### 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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUN 2017

Title: Group Leader



# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17133356

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 424739002

Sample Amount 930 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608043.wiff

Date Analyzed: 09-JUN-17 17:46

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.269	U	0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.538	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17133356

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 424739002

Sample Amount 930 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.08	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	QU	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	2.97		0.086	0.269
<i>121-82-4</i>	<i>RDX</i>				

# **Quality Control Summary**

**High Explosives Surrogate Recovery Summary****Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1645**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424739002	CAPA-17133356	92	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

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

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1645

**Extract Batch Code:** 1671745

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

**GEL LCS ID:** 1203805556

**GEL LCSDUP ID:** .

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

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

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

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

\* Values outside of QC limits

3  
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL Spike ID: 1203805559

GEL SpikeDup ID: 1203805560

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

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

Reporting Units: ug/L

QC Type: MS/MSD

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

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

# Quality Control Data



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

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

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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



## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1645Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1645Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 08-JUN-17 22:28

GEL Data File: EXP0608010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK03

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

**GEL Data File:** EXP0608014.wiff

**Instrument ID:** LCMSMS5

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

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	3.17

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 09-JUN-17 04:54

GEL Data File: EXP0608021.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK05

**Analysis Date:** 09-JUN-17 07:15

**GEL Data File:** EXP0608025.wiff

**Instrument ID:** LCMSMS5

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

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 09-JUN-17 08:25

GEL Data File: EXP0608027.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

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

**GEL Data File:** EXP0608038.wiff

**Instrument ID:** LCMSMS5

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

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



4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 09-JUN-17 16:01

GEL Data File: EXP0608040.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A  
Explosives Continuing Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 09-JUN-17 22:27

**GEL Data File:** EXP0608051.wiff

**Instrument ID:** LCMSMS5

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

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

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

**GEL Data File:** EXP0608060.wiff

**Instrument ID:** LCMSMS5

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

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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

# Miscellaneous

### DATA EXCEPTION REPORT

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

**Originator's Name:**

Charles Wilson 14-JUN-17

**Data Validator/Group Leader:**

Michael Penny 14-JUN-17

# Metals Analysis



# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1645**  
**Work Order #: 424739**

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
424739002	CAPA-17133356
1203805071	Method Blank (MB) <b>ICP</b>
1203805072	Laboratory Control Sample (LCS)
1203805075	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805073	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805074	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805126	Method Blank (MB) <b>ICP-MS</b>
1203805127	Laboratory Control Sample (LCS)
1203805130	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805128	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805129	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203810085	Method Blank (MB) <b>CVAA</b>
1203810086	Laboratory Control Sample (LCS)
1203810092	424739001(CAPA-17133354L) Serial Dilution (SD)
1203810088	424739001(CAPA-17133354D) Sample Duplicate (DUP)
1203810090	424739001(CAPA-17133354S) Matrix Spike (MS)

**Sample Analysis**

Samples 424739001 and 002 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1671565, 1671589, 1673477 and 1677435
<b>Prep Batch :</b>	1671563, 1671587 and 1673474
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

**Preparation/Analytical Method Verification**

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

**System Configuration**

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

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

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

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

### **Calibration Information**

#### **Instrument Calibration**

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

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

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium, sodium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 424739001 (CAPA-17133354)-ICP.

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

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

#### **Continuing Calibration Blanks (CCB) Requirements**

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

#### **Continuing Calibration Verification (CCV) Requirements**

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

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

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

The MBs analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

#### **Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 424741001 (CAPA-17-133353)-ICP and ICP-MS and 424739001 (CAPA-17133354)-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: 2017-1645 GEL Work Order: 424739

#### **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: 26 JUN 2017**

**Title: Data Validator**

# **Sample Data Summary**

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424739001**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133354**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:37	061417W1-7	1673477



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

SDG No: 2017-1645

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424739001

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: CAPA-17133354

LEVEL: Low

DATE RECEIVED 06-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	06/14/17 18:09	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-39-3	Barium	19.9	ug/L		1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-70-2	Calcium	10100	ug/L		50	200	200	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7439-95-4	Magnesium	3380	ug/L		110	300	300	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-98-7	Molybdenum	0.561	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-09-7	Potassium	1210	ug/L		50	150	150	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7631-86-9	Silica	57600	ug/L		53	213	213	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-23-5	Sodium	9740	ug/L		100	300	300	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-24-6	Strontium	52.3	ug/L		1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-61-1	Uranium	0.386	ug/L		0.067	0.2	0.2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7440-62-2	Vanadium	2.65	ug/L	J	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424739001**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133354**LEVEL:** Low**DATE RECEIVED** 06-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	39.2	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1671565	1671563	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1671589	1671587	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

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

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424739002**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133356**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:49	061417W1-7	1673477

**Prep Information:**

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

**\*Analytical Methods:**

AV EPA 245.2 1974

# **Quality Control Summary**

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

SDG NO. 2017-1645

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>
1203805071	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	-4.22	ug/L	+/-10	J	P	3.3	10
1203805126	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
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1645 Client ID: CAPA-17-133353S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424741001 Spike ID: 1203805074

<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	5750		664		5000	102		P
Barium	ug/L	75-125	548		56.6		500	98.3		P
Beryllium	ug/L	75-125	498		1	U	500	99.6		P
Boron	ug/L	75-125	531		17.3	J	500	103		P
Calcium	ug/L	75-125	20700		15700		5000	99.5		P
Cobalt	ug/L	75-125	491		1	U	500	98.3		P
Copper	ug/L	75-125	520		3	U	500	104		P
Iron	ug/L	75-125	5370		325		5000	101		P
Magnesium	ug/L	75-125	9090		4110		5000	99.4		P
Manganese	ug/L	75-125	493		2	U	500	98.3		P
Potassium	ug/L	75-125	8010		2930		5000	102		P
Silica	ug/L	75-125	51700		40500		10700	105		P
Sodium	ug/L	75-125	25600		19600		5000	119		P
Strontium	ug/L	75-125	601		95.7		500	101		P
Tin	ug/L	75-125	496		2.5	U	500	98.8		P
Vanadium	ug/L	75-125	511		3.28	J	500	101		P
Zinc	ug/L	75-125	469		3.3	U	500	93.8		P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1645 Client ID: CAPA-17-133353S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424741001 Spike ID: 1203805129

<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>
Uranium	ug/L	75-125	46.6		0.184	J	50	92.8		MS
Antimony	ug/L	75-125	50.1		1	U	50	99.8		MS
Arsenic	ug/L	75-125	52		2	U	50	100		MS
Cadmium	ug/L	75-125	49.9		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	49.6		3	U	50	97.4		MS
Lead	ug/L	75-125	47.4		0.5	U	50	94.5		MS
Molybdenum	ug/L	75-125	51.9		0.948		50	102		MS
Nickel	ug/L	75-125	49.1		0.812	J	50	96.5		MS
Selenium	ug/L	75-125	47		2	U	50	92		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	43.9		0.6	U	50	87.8		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17133354S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 424739001 **Spike ID:** 1203810090

<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	2.09		0.067	U	2	104		AV

## \*Analytical Methods:

AV EPA 245.1/245.2



**Metals**  
**–6–**  
**Duplicate Sample Summary**

SDG No.: 2017–1645

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–17–133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805073

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	664		647		2.55		P
Barium	ug/L	+/-20%	56.6		56		1.16		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	17.3 J		16.2 J		6.54		P
Calcium	ug/L	+/-20%	15700		15500		1.48		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	325		324		.401		P
Magnesium	ug/L	+/-20%	4110		4050		1.64		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	2930		2870		2.21		P
Silica	ug/L	+/-20%	40500		39700		2.01		P
Sodium	ug/L	+/-20%	19600		20000		1.78		P
Strontium	ug/L	+/-20%	95.7		94.9		.858		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	3.28 J		2.3 J		34.9		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2017-1645

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805128

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.948		0.933		1.59		MS
Nickel	ug/L		0.812 J		0.6 U		200		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	0.184 J		0.177 J		3.88		MS

\*Analytical Methods:

MS SW846 3005A/6020A

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2017–1645**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAPA–17133354D**Matrix:** WATER**Level:** Low**Sample ID:** 424739001**Duplicate ID:** 1203810088**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1645

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>
1203805072								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5070		101	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	520		104	80-120	P
	Iron	ug/L	5000	5120		102	80-120	P
	Magnesium	ug/L	5000	5170		103	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5150		103	80-120	P
	Silica	ug/L	10700	10600		99.1	80-120	P
	Sodium	ug/L	5000	5490		110	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	499		99.9	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	479		95.8	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1645

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>
1203805127								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	53.3		107	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	51.8		104	80-120	MS
	Lead	ug/L	50	49.5		99	80-120	MS
	Molybdenum	ug/L	50	49.8		99.6	80-120	MS
	Nickel	ug/L	50	51.9		104	80-120	MS
	Selenium	ug/L	50	51.2		102	80-120	MS
	Silver	ug/L	50	50.7		101	80-120	MS
	Thallium	ug/L	50	45.1		90.3	80-120	MS
	Uranium	ug/L	50	47.2		94.5	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1645

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203810086	Mercury	ug/L	2	2.04		102	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1645 Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 424741001 Serial Dilution ID: 1203805075

<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	664		679	J	2.358			P
Barium	56.6		57.7		1.911		10	P
Beryllium	1	U	5	U				P
Boron	17.3	J	75	U	52.718			P
Calcium	15700		16100		2.573		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	325		339	J	4.313			P
Magnesium	4110		4070		1.058			P
Manganese	2	U	10	U				P
Potassium	2930		3030		3.494		10	P
Silica	40500		40100		.913		10	P
Sodium	19600		20700		5.351		10	P
Strontium	95.7		98.4		2.825		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.28	J	5	U	135.167			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17-133353L

**Contract:** ESHL00114

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

**Sample ID:** 424741001 **Serial Dilution ID:** 1203805130

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.948		1.15	J	20.781			MS
Nickel	.812	J	5.81	J	614.901			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.184	J	.335	U	2.174			MS

## \*Analytical Methods:

MS SW846 3005A/6020A



## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17133354L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424739001 **Serial Dilution ID:** 1203810092

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

## \*Analytical Methods:

AV EPA 245.1/245.2

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1671529

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805981	Method Blank (MB)
1203805982	Laboratory Control Sample (LCS)
1203805984	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805986	424739002(CAPA-17133356) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 15.

**Preparation/Analytical Method Verification**

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

**Calibration Information**

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

acceptance limits.

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 424739002 (CAPA-17133356) was selected for QC analysis.

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

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

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

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Preservation/Integrity**

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

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

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

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1671534	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1671533	<b>Method:</b>	EPA 335.4

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805008	Method Blank (MB)
1203805009	Laboratory Control Sample (LCS)
1203805010	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805012	424739002(CAPA-17133356) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Y Intercept Rule**

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

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

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424739002 (CAPA-17133356) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1671680

**Method:** WSP-ANIONS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805353	Method Blank (MB)
1203805354	Laboratory Control Sample (LCS)
1203805355	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805356	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) 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 1203805355 (CAWA-17-134176DUP) and 1203805356 (CAWA-17-134176PS) 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**

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

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

#### **Manual Integrations**

Samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS) and 424739001 (CAPA-17133354) 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**

<b>Product:</b>	<b>Ammonia Nitrogen</b>		
<b>Analytical Batch:</b>	1671935	<b>Method:</b>	NH3
<b>Prep Batch :</b>	1671933	<b>Method:</b>	EPA 350.1 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806101	Method Blank (MB)
1203806102	Laboratory Control Sample (LCS)
1203806103	424741001(CAPA-17-133353) Sample Duplicate (DUP)
1203806104	424741001(CAPA-17-133353) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

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

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

acceptance limits.

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424741001 (CAPA-17-133353) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1671942	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1671941	<b>Method:</b>	EPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203806126	Method Blank (MB)
1203806127	Laboratory Control Sample (LCS)
1203806128	424741002(CAPA-17-133355) Sample Duplicate (DUP)
1203806129	424741002(CAPA-17-133355) 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 424741002 (CAPA-17-133355) 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 1203806126 (MB) and 1203806127 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1671832

**Method:** NO3NO2

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805863	Method Blank (MB)
1203805864	Laboratory Control Sample (LCS)
1203805866	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805867	424853003(NonSDG) Sample Duplicate (DUP)
1203805871	424735002(CAWA-17-134176) Post Spike (PS)
1203805872	424853003(NonSDG) 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**

Samples 424735002 (CAWA-17-134176) and 424853003 (NonSDG) were selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1671937	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1671936	<b>Method:</b>	EPA 365.4 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806112	Method Blank (MB)
1203806113	Laboratory Control Sample (LCS)
1203806120	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203806121	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

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

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

#### **Technical Information**

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

##### **Holding Times**

All samples in this SDG met the specified holding time.

##### **Sample Preservation/Integrity**

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

##### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

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

##### **Additional Comments**

Additional comments were not required for this SDG.

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

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

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

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



### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1671665

**Method:** TDS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805322	Method Blank (MB)
1203805323	Laboratory Control Sample (LCS)
1203805324	424739001(CAPA-17133354) 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 424739001 (CAPA-17133354) was selected for QC analysis.

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

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

Analyte	Sample	Value
Total Dissolved Solids	1203805324 (CAPA-17133354DUP)	13.3* (0%-5%)

#### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

A data exception report (DER) 1640819 was generated for sample 1203805324 (CAPA-17133354DUP) in this SDG/batch.

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1671823

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

### **Calibration Verification Information**

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

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1671988 **Method:** PH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

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

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

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424739001 (CAPA-17133354)	pH	Received 06-JUN-17, out of holding 01-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****Data Exception (DER) Documentation**

A data exception report (DER) 1640886 was generated for samples 424739001 (CAPA-17133354) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1671987      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 424747001 (CAWA-17-133332) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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**Certification Statement**

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



## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

#### 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: 22 JUN 2017

Title: Analyst I

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1645

Client Sample ID: CAPA-17133354  
Sample ID: 424739001  
Matrix: W  
Collect Date: 01-JUN-17 13:35  
Receive Date: 06-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	06/06/17	2210	1671680	1
Chloride		1.34	0.067	0.200	mg/L		1					
Fluoride	J	0.0724	0.033	0.100	mg/L		1					
Sulfate		2.07	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0939	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1007	1671935	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.615	0.017	0.050	mg/L		1	AXH3	06/09/17	1009	1671832	3
PO4 "As Received"												
Phosphorus, Total as P		0.055	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1322	1671937	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		149	3.40	14.3	mg/L			KLP1	06/08/17	1627	1671665	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		55.8	1.45	4.00	mg/L			RXB5	06/09/17	1342	1671987	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		139	1.00	1.00	umhos/cm		1	VH1	06/08/17	1100	1671823	7
PH "As Received"												
pH at Temp 10.2C	H	7.85	0.010	0.100	SU		1	RXB5	06/09/17	1340	1671988	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1671933
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/08/17	1700	1671936

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## Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1645

Client Sample ID: CAPA-17133354  
Sample ID: 424739001

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

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## Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Client SDG: 2017-1645

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-17133356

Project: ESHL00114

Sample ID: 424739002

Client ID: ARSL004

Matrix: W

Collect Date: 01-JUN-17 13:35

Receive Date: 06-JUN-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.455	0.330	1.00	mg/L		1	TSM	06/09/17	0310	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	1000	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.154	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1505	1671942	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0842	1671533
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/08/17	1700	1671941

The following Analytical Methods were performed:

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

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: June 22, 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: 424739

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1671529										
QC1203805984	424739002	DUP									
Total Organic Carbon Average		J	0.455	J	0.416	mg/L	8.96	^	(+/-1.00)	TSM	06/09/17 03:57
QC1203805982	LCS										
Total Organic Carbon Average	10.0				10.6	mg/L			106	(80%-120%)	06/09/17 00:26
QC1203805981	MB										
Total Organic Carbon Average				U	ND	mg/L					06/09/17 00:15
QC1203805986	424739002	PS									
Total Organic Carbon Average	10.0	J	0.455		11.6	mg/L			111	(75%-125%)	06/09/17 04:44
<b>Flow Injection Analysis</b>											
Batch	1671534										
QC1203805010	424739002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			AXH3	06/07/17 10:01
QC1203805009	LCS										
Cyanide, Total	50.0				51.6	ug/L			103	(90%-110%)	06/07/17 09:48
QC1203805008	MB										
Cyanide, Total				U	ND	ug/L					06/07/17 09:47
QC1203805012	424739002	MS									
Cyanide, Total	100	U	ND		106	ug/L			106	(90%-110%)	06/07/17 10:02
<b>Ion Chromatography</b>											
Batch	1671680										
QC1203805355	424735002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A			MXL2	06/06/17 20:43

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## QC Summary

Workorder: 424739

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1671680										
Chloride		15.2		15.2	mg/L	0.0289		(0%-20%)	MXL2	06/08/17	04:23
Fluoride		0.161		0.160	mg/L	1.06	^	(+/-0.100)		06/06/17	20:43
Sulfate		7.13		6.96	mg/L	2.31		(0%-20%)			
QC1203805354 LCS											
Bromide	1.25			1.23	mg/L		98.5	(80%-120%)		06/06/17	19:45
Chloride	5.00			4.61	mg/L		92.3	(80%-120%)			
Fluoride	2.50			2.37	mg/L		94.9	(80%-120%)			
Sulfate	10.0			9.58	mg/L		95.8	(80%-120%)			
QC1203805353 MB											
Bromide			U	ND	mg/L					06/06/17	19:17
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203805356 424735002 PS											
Bromide	1.25	U	ND	1.23	mg/L		98.8	(75%-125%)		06/06/17	21:12
Chloride	5.00		7.60	13.1	mg/L		111	(75%-125%)		06/08/17	04:52
Fluoride	2.50		0.161	2.50	mg/L		93.4	(75%-125%)		06/06/17	21:12
Sulfate	10.0		7.13	17.2	mg/L		101	(75%-125%)			



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## QC Summary

Workorder: 424739

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1671832										
QC1203805866	424735002	DUP									
Nitrogen, Nitrate/Nitrite	J	0.0222	J	0.0219	mg/L	1.36	^	(+/-0.050)	AXH3	06/09/17	10:00
QC1203805867	424853003	DUP									
Nitrogen, Nitrate/Nitrite		1.12		1.11	mg/L	0.897		(0%-20%)		06/09/17	10:28
QC1203805864	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.997	mg/L			99.7	(90%-110%)	06/09/17	09:52
QC1203805863	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/09/17	09:51
QC1203805871	424735002	PS									
Nitrogen, Nitrate/Nitrite	1.00	J	0.0222	1.02	mg/L			99.8	(90%-110%)	06/09/17	10:01
QC1203805872	424853003	PS									
Nitrogen, Nitrate/Nitrite	1.00		1.12	2.04	mg/L			92	(90%-110%)	06/09/17	10:29
Batch	1671935										
QC1203806103	424741001	DUP									
Nitrogen, Ammonia		0.0858		0.0733	mg/L	15.7	^	(+/-0.050)	KLP1	06/09/17	10:13
QC1203806102	LCS										
Nitrogen, Ammonia	1.00			1.01	mg/L			101	(90%-110%)	06/09/17	10:02
QC1203806101	MB										
Nitrogen, Ammonia			J	0.0385	mg/L					06/09/17	10:01
QC1203806104	424741001	MS									
Nitrogen, Ammonia	1.00		0.0858	1.03	mg/L			94.4	(90%-110%)	06/09/17	10:14
Batch	1671937										
QC1203806120	424735002	DUP									
Phosphorus, Total as P		0.0744		0.0757	mg/L	1.73	^	(+/-0.050)	KLP1	06/09/17	13:20

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## QC Summary

Workorder: 424739

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1671937										
QC1203806113	LCS										
Phosphorus, Total as P	1.00			0.848	mg/L		84.8	(80%-124%)	KLP1	06/09/17	13:07
QC1203806112	MB										
Phosphorus, Total as P			U	ND	mg/L					06/09/17	13:06
QC1203806121	424735002	MS									
Phosphorus, Total as P	1.00	0.0744		1.03	mg/L		95.6	(63%-139%)		06/09/17	13:21
Batch	1671942										
QC1203806128	424741002	DUP									
Nitrogen, Total Kjeldahl		0.336		0.308	mg/L	8.7	^	(+/-0.100)	KLP1	06/09/17	15:06
QC1203806127	LCS										
Nitrogen, Total Kjeldahl	1.00			0.953	mg/L		95.3	(90%-110%)		06/09/17	15:14
QC1203806126	MB										
Nitrogen, Total Kjeldahl			J	0.0715	mg/L					06/09/17	15:13
QC1203806129	424741002	MS									
Nitrogen, Total Kjeldahl	1.00	0.336		1.35	mg/L		101	(90%-110%)		06/09/17	15:07
<b>Solids Analysis</b>											
Batch	1671665										
QC1203805324	424739001	DUP									
Total Dissolved Solids		149		130	mg/L	13.3*		(0%-5%)	KLP1	06/08/17	16:27
QC1203805323	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		06/08/17	16:27
QC1203805322	MB										
Total Dissolved Solids			U	ND	mg/L					06/08/17	16:27

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## QC Summary

Workorder: 424739

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1671823										
QC1203805835	424596002	DUP									
Conductivity		236		233	umhos/cm	1.28		(0%-10%)	VH1	06/08/17	10:57
QC1203805836	424747001	DUP									
Conductivity		157		156	umhos/cm	0.639		(0%-10%)		06/08/17	11:04
QC1203805834	LCS										
Conductivity	1410			1400	umhos/cm		99.2	(95%-105%)		06/08/17	10:45
Batch	1671987										
QC1203806285	424747001	DUP									
Alkalinity, Total as CaCO3		58.6		59.0	mg/L	0.68		(0%-20%)	RXB5	06/09/17	13:58
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203806283	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		06/09/17	13:09
QC1203806287	424747001	MS									
Alkalinity, Total as CaCO3	100	58.6		165	mg/L		107	(80%-120%)		06/09/17	13:59
Batch	1671988										
QC1203806296	424596002	DUP									
pH	H	7.26	H	7.27	SU	0.138		(0%-5%)	RXB5	06/09/17	13:23
QC1203806295	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		06/09/17	13:08

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

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 424739

Page 6 of 6

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

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

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

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

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

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

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 09-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE ANALYTICAL	<b>Test / Method:</b> EPA 160.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1671665	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424739(2017-1645),424741(2017-1644)</b> <b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP: QC 1203805324DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203805324 (CAPA-17133354DUP) [13.3* (0%-5%)].	

**Originator's Name:**

Kristen Mizzell 09-JUN-17

**Data Validator/Group Leader:**

Aubrey Kingsbury 12-JUN-17

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 10-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GELC
<b>Batch ID:</b> 1671988	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 424296,424297,424596(2017-1633),424735(2017-1647),424739(2017-1645),424741(2017-1644),424747(2017-1649) <b>Application Issues:</b> Sample received out of holding Sample Logged out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Logged out of Holding: 424296 001  2. Sample received out of holding: 424297 001 424596 002,003,007,010 424735 002,004 424739 001 424741 001,003,006,008,009 424747 001 QC 1203806296DUP,1203806297DUP		1. Sample (See Below) was logged in for this analysis outside of the method specified holding time. The data is qualified. 424296001 (Rad Pyridine 7647) [Logged 30-MAY-17, out of holding 30-MAY-17].  2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203806296 (CAWA-17-133306DUP) [Received 02-JUN-17, out of holding 31-MAY-17]. 1203806297 (CAWA-17-13332DUP) [Received 06-JUN-17, out of holding 02-JUN-17]. 424297001 (Non-Rad Pyridine 7856) [Received 30-MAY-17, out of holding 30-MAY-17]. 424596002 (CAWA-17-133306) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596003 (CAWA-17-133334) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596007 (CAWA-17-134191) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596010 (CAWA-17-133316) [Received 02-JUN-17, out of holding 31-MAY-17]. 424735002 (CAWA-17-134176) [Received 06-JUN-17, out of holding 02-JUN-17]. 424735004 (CAWA-17-133309) [Received 06-JUN-17, out of holding 02-JUN-17]. 424739001 (CAPA-17133354) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741001 (CAPA-17-133353) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741003 (CAPA-17-133360) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741006 (CAWA-17-133318) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741008 (CAPA-17-133358) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741009 (CAPA-17-133359) [Received 06-JUN-17, out of holding 01-JUN-17]. 424747001 (CAWA-17-133332) [Received 06-JUN-17, out of holding 02-JUN-17].	

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

**Originator's Name:**  
Rachael Bell      10-JUN-17

**Data Validator/Group Leader:**  
Elzbieta Szulc      12-JUN-17



July 19, 2017

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

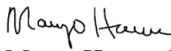
Re: LANL- WQH Water Samples  
Work Order: 424739  
SDG: 2017-1645

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 06, 2017, and analyzed for Explosives by LCMSMS, 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 HMX, DNX, and TNX on the HE Form 1s.

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

Sincerely,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1645  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 424739**  
**SDG: 2017-1645**

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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 424739  
SDG # : 2017-1645**

**June 26, 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 06, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

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

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
424739001	CAPA-17133354
424739002	CAPA-17133356
424739003	CAPA-17133363
424739004	CAPA-17133364

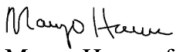
**Case Narrative**

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

**Data Package**

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

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

  
Margo Herron for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 26 June 2017**

<b>State</b>	<b>Certification</b>
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404



# **Chain of Custody and Supporting Documentation**





Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424739</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/6/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other <u>5908 1782 1683 - 4°C</u> <u>5908 1782 1672 - 4°C</u> <u>5908 1782 1650 - 3°C</u> <u>5908 1782 1694 - 4°C</u> <u>5908 1782 1709 - 5°C</u> <u>5908 1782 1640 - 5°C</u> <u>5908 1782 1661 - 5°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <input checked="" type="radio"/> CPM / mR/Hr Classified as: Rad 1    Rad 2    Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's    Flammable    Foreign Soil    RCRA    Asbestos    Beryllium    Other: _____	
Sample Receipt Criteria		Yes	NA
1 Shipping containers received intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Chain of custody documents included with shipment?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5 Sample containers intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7 Do any samples require Volatile Analysis?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8 Samples received within holding time?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9 Sample ID's on COC match ID's on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10 Date & time on COC match date & time on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11 Number of containers received match number indicated on COC?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
12 Are sample containers identifiable as GEL provided?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13 COC form is properly signed in relinquished/received sections?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed): <u>* We also rec'd 2 VOA vials for CAWA-17-13394 not indicated on the CoC.</u> <u>* We only rec'd 1 VOA vial for WSTMD-17-136839</u>			

PM (or PMA) review: Initials

MEH

Date

6/7/17

Page

1of 1

GL-CHL-SR-001 Rev 5

ORIGIN ID: SAFA (505) 865-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 05JUN17  
ACTWGT: 51.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS

GENERAL ENGINEERING LAB  
2040 SAVAGE RD

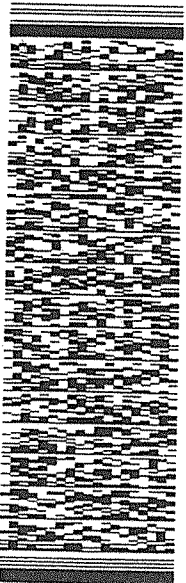
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



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Express



TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

2 of 2

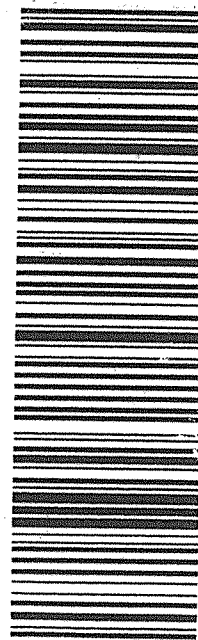
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Mstr# 5908 1782 1640

0201

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SC-US  
CHS



Part # 156148V-434 R1T2 08/15 33

ORIGIN ID: SAFA (505) 865-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 05JUN17  
ACTWGT: 50.0 LB MAN  
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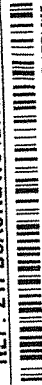
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GENERAL ENGINEERING LAB  
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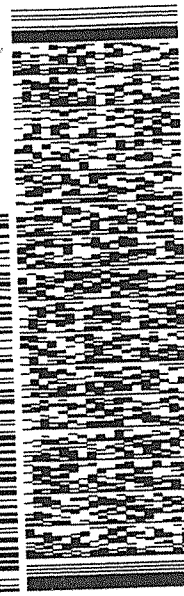
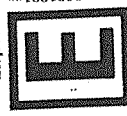
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(843) 566-8171

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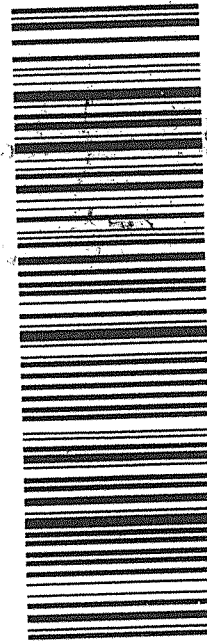
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TRK# 5908 1782 1683

## MASTER ##

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SC-US  
CHS



Part # 156148V-434 R1T2 08/15 33

538C1/A502/329B

4c

538C1/A502/329B

3c

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: 05JUN17  
ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2916

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

LOS ALAMOS, NM 87545  
UNITED STATES US

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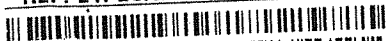
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GENERAL ENGINEERING LAB  
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CHARLESTON SC 29407

(843) 556-8171

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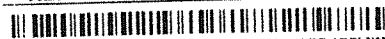


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GENERAL ENGINEERING LAB  
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CHARLESTON SC 29407

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1 of 2  
TRK# 5908 1782 1640  
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## MASTER ##

X7 RBWA

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PRIORITY OVERNIGHT

2940  
SC-US CH



2 of 2  
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Mstr# 5908 1782 1661

0201

X7 RBWA

2940  
SC-US CH

Part # 155148V-434 RIT2 06/15



SHIP DATE: 05JUN17  
ACTWGT: 52.0 LB MAN  
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KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03

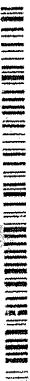
LOS ALAMOS, NM 87545  
UNITED STATES US

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



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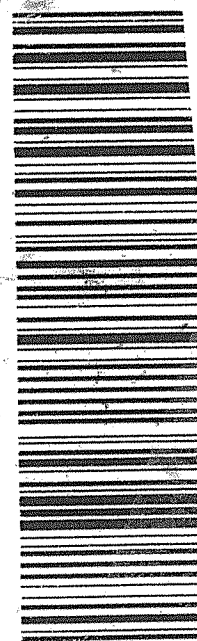
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X7 RBWA

29407  
SC-US CHS



Part # 155148V-434 RIT2 06/15

SHIP DATE: 05JUN17  
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CRD: 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  
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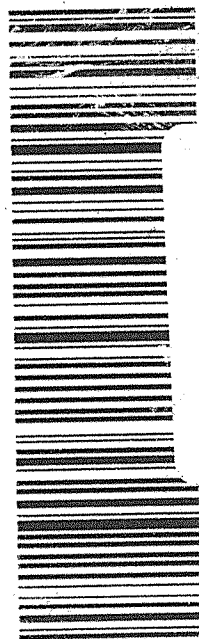


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TRK# 5908 1782 1709

X7 RBWA

29407  
SC-US CHS



RT 257  
ST F1  
5 E  
10:30 1709  
06.06

Part # 156148V-434 RIT2 06/15 39

ORIGIN ID: SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171  
REF: 21PD0ASRGW04BAGWE0



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Express

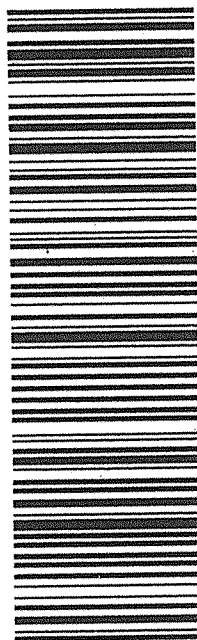


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PRIORITY OVERNIGHT

1 of 2  
TRK# 5908 1782 1661  
## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 39

# **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 #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1671196

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
424739003	CAPA-17133363
424739004	CAPA-17133364
1203804346	424596006(CAWA-17-134191) Post Spike (PS)
1203804347	424596006(CAWA-17-134191) Post Spike (PS)
1203804348	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203804349	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203806749	Method Blank (MB)
1203806750	Laboratory Control Sample (LCS)
1203806751	Laboratory Control Sample (LCS)
1203807982	Method Blank (MB)
1203807986	Laboratory Control Sample (LCS)

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

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

**SOP Reference**

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

**Calibration Information**

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

industry shortage.

#### **Initial Calibration**

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

#### **Continuing Calibration Verification Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

The LCS spike recoveries met the acceptance limits.

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

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

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

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

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

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

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

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

#### **Technical Information**

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

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

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

All samples met the sample preservation and integrity requirements.

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

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

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

##### **Manual Integrations**

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

manual integrations.

#### **TIC Comment**

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Residual Chlorine**

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

#### **Electronic Package Comment**

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

#### **System Configuration**

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

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

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

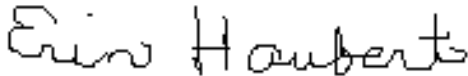
#### The Qualifiers in this report are defined as follows:

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

#### Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 25 JUN 2017

Title: Data Validator

# **Sample Data Summary**



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 424739002

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133356

Batch ID: 1671196

Run Date: 06/08/2017 14:42

Prep Date: 06/08/2017 14:42

Data File: 060817V4\4L414.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: 2017-1645

Lab Sample ID: 424739002

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133356

Batch ID: 1671196

Run Date: 06/08/2017 14:42

Prep Date: 06/08/2017 14:42

Data File: 060817V4\4L414.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.64	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:** 2017-1645  
**Lab Sample ID:** 424739002  
  
**Client ID:** CAPA-17133356  
**Batch ID:** 1671196  
**Run Date:** 06/08/2017 14:42  
**Prep Date:** 06/08/2017 14:42  
**Data File:** 060817V4\4L414.D

**Date Collected:** 06/01/2017 13:35  
**Date Received:** 06/06/2017 09:05  
**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	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	49.0	50.0	ug/L 98	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.403	7.07	ug/L	0	J
	unknown siloxane	12.205	5.3	ug/L	0	J
	unknown siloxane	14.576	7.8	ug/L	0	J

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

SDG Number: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.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: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.82	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: 2017-1645

Lab Sample ID: 424739003

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAPA-17133363

Batch ID: 1671196

Run Date: 06/08/2017 15:10

Prep Date: 06/08/2017 15:10

Data File: 060817V4\4L415.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	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	54.5	50.0	ug/L 109	(70%-131%)
Toluene-d8	49.4	50.0	ug/L 99	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	6.56	ug/L	0	J
	unknown siloxane	14.576	12.3	ug/L	0	J

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

SDG Number: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17133364

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 15:39

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 15:39

Column: DB-624

Data File: 060817V4\4L416.D

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: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 15:39

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 15:39

Data File: 060817V4\4L416.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.95	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: 2017-1645

Lab Sample ID: 424739004

Date Collected: 06/01/2017 13:35

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17133364

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 15:39

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 15:39

Column: DB-624

Data File: 060817V4\4L416.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.5	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	53.2	50.0	ug/L 106	(70%-131%)
Toluene-d8	48.3	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	8.8	ug/L	0	J
	unknown siloxane	14.576	15.8	ug/L	0	J

# **Quality Control Summary**

Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1645

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203806750	LCS for batch 1671196	101	101	108
1203806751	LCS for batch 1671196	109	102	113
1203806749	MB for batch 1671196	106	101	111
424739002	CAPA-17133356	102	98	106
424739003	CAPA-17133363	106	99	109
424739004	CAPA-17133364	105	97	106
1203804346	CAWA-17-134191PS	90	98	99
1203804348	CAWA-17-134191PSD	98	100	100
1203807986	LCS for batch 1671196	102	98	109
1203807982	MB for batch 1671196	97	98	109
1203804347	CAWA-17-134191PS	97	94	105
1203804349	CAWA-17-134191PSD	96	94	106

## Surrogate

## Acceptance Limits

DCED4 = 1,2-Dichloroethane-d4 (71%-134%)  
TOL = Toluene-d8 (74%-124%)  
BFB = Bromofluorobenzene (70%-131%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	87.0	87	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	832	67	56-131
67-64-1	PS Acetone	250	0.00 U	96.3	39	25-155
74-88-4	PS Iodomethane	250	0.00 U	196	78	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	201	80	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	220	88	48-133
78-93-3	PS 2-Butanone	250	0.00 U	127	51	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	175	70	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	158	63	33-138
75-09-2	PS Methylene chloride	50.0	1.24 J	38.0	73	62-123
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	38.6	77	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.4	89	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.2	96	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.2	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.1	92	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.0	92	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	47.5	95	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	38.9	78	59-130
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	37.6	75	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	41.5	83	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	39.9	80	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	40.5	81	71-130
67-66-3	PS Chloroform	50.0	0.00 U	40.5	81	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	39.8	80	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	39.6	79	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	41.8	84	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	40.3	81	69-130
71-43-2	PS Benzene	50.0	0.00 U	40.0	80	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	41.0	82	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	41.5	83	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	39.8	80	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	42.2	84	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	40.3	81	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.0	82	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	42.5	85	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	39.3	79	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	39.4	79	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	40.8	82	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	37.6	75	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	40.1	80	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	41.0	82	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.8	86	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	44.4	89	62-131
100-42-5	PS Styrene	50.0	0.00 U	46.1	92	59-135
75-25-2	PS Bromoform	50.0	0.00 U	41.6	83	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	42.4	85	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	37.1	74	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	36.7	73	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	40.9	82	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	42.2	84	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	44.2	88	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	42.3	85	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	41.4	83	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	43.8	88	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	43.3	87	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	44.1	88	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	44.6	89	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	40.8	82	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	40.2	80	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	43.0	86	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	31.0	62	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	39.3	79	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	38.0	76	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	38.8	78	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	37.3	75	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	43.9	88	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	40.4	81	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	3980	80	60-140

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00 U	84.4	84	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	975	78	56-131	16	0-20
67-64-1	PSD Acetone	250	0.00 U	112	45	25-155	15	0-20
74-88-4	PSD Iodomethane	250	0.00 U	198	79	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	198	79	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	239	95	48-133	8	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	148	59	25-143	15	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	201	81	61-127	14	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	178	71	33-138	12	0-20
75-09-2	PSD Methylene chloride	50.0	1.24 J	38.8	75	62-123	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	40.6	81	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	44.1	88	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	48.6	97	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	44.3	89	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	46.4	93	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	45.2	90	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.0	102	69-127	7	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	38.8	78	59-130	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	40.6	81	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	41.1	82	69-127	1	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	39.2	78	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	40.9	82	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	39.9	80	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	39.7	79	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	38.6	77	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	40.8	82	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	41.8	84	69-130	4	0-20
71-43-2	PSD Benzene	50.0	0.00 U	39.2	78	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	41.1	82	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	41.3	83	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	42.2	84	72-129	6	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	42.8	86	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	41.7	83	70-134	3	0-20
108-88-3	PSD Toluene	50.0	0.00 U	40.2	80	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	43.4	87	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	41.7	83	66-125	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	41.3	83	67-124	5	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	40.1	80	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	38.7	77	68-143	3	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	42.1	84	71-127	5	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	40.5	81	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	41.5	83	61-130	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	43.4	87	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	45.7	91	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	43.8	88	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	40.0	80	55-133	6	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	39.2	78	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	38.1	76	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	40.3	81	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	40.3	81	50-133	5	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	42.4	85	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	39.7	79	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	42.4	85	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	41.7	83	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	42.1	84	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	43.0	86	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	39.6	79	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	39.4	79	55-125	2	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	41.3	83	43-142	4	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	36.4	73	62-141	16	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	38.9	78	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	43.2	86	62-134	13	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	41.0	82	52-135	6	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	39.1	78	50-133	5	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	44.2	88	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	40.0	80	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4640	93	60-140	15	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1645

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804347

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:30

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1645

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804349

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:59

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	88.8	89	71-127
75-05-8	LCS Acetonitrile	1250	0.0	948	76	61-125
67-64-1	LCS Acetone	250	0.0	263	105	48-157
74-88-4	LCS Iodomethane	250	0.0	210	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	213	85	69-138
108-05-4	LCS Vinyl acetate	250	0.0	245	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	226	90	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	208	83	66-124
591-78-6	LCS 2-Hexanone	250	0.0	246	98	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	45.6	91	40-160
74-87-3	LCS Chloromethane	50.0	0.0	39.4	79	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	44.0	88	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.6	93	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.4	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	53.8	108	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.4	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.8	88	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	38.9	78	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	43.0	86	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.3	89	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	44.0	88	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	47.8	96	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.2	84	76-125
67-66-3	LCS Chloroform	50.0	0.0	43.9	88	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.0	88	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.3	95	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	42.7	85	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.9	92	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.6	85	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	42.8	86	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	45.2	90	78-131
108-88-3	LCS Toluene	50.0	0.0	43.1	86	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.1	94	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	42.9	86	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.0	84	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	42.5	85	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.6	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	44.0	88	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.3	85	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.5	89	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.2	92	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.3	93	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.7	83	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	41.5	83	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	43.2	86	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	44.9	90	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.5	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	43.7	87	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.5	89	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.5	93	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.2	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.0	92	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.2	94	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	42.4	85	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	42.3	85	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	39.5	79	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	45.7	91	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	42.5	85	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	46.3	93	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.7	85	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4640	93	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806751

Instrument: VOA4.I

Analysis Date: 06/08/2017 10:50

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	291	116	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	248	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	256	102	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	259	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	264	106	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	257	103	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2650	106	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.9	84	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1645

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203807986

Instrument: VOA4.I

Analysis Date: 06/09/2017 14:13

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	279	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	238	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	251	100	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	264	106	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	266	106	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2710	108	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	42.3	85	66-147

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1645	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060817V4\4L407.D
Lab Sample ID:	1203806749	Prep Date:	06/08/2017 11:19	Analyzed:	06/08/17 11:19
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1671196	1203806750	060817V4\4L403A.D	06/08/17	0924
02 LCS for batch 1671196	1203806751	060817V4\4L406A.D	06/08/17	1050
03 CAPA-17133356	424739002	060817V4\4L414.D	06/08/17	1442
04 CAPA-17133363	424739003	060817V4\4L415.D	06/08/17	1510
05 CAPA-17133364	424739004	060817V4\4L416.D	06/08/17	1539
06 CAWA-17-134191PS	1203804346	060817V4\4L420.D	06/08/17	1735
07 CAWA-17-134191PSD	1203804348	060817V4\4L421.D	06/08/17	1804

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1645	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060917V4\4L508.D
Lab Sample ID:	1203807982	Prep Date:	06/09/2017 14:42	Analyzed:	06/09/17 14:42
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
09 LCS for batch 1671196	1203807986	060917V4\4L507A.D	06/09/17	1413
10 CAWA-17-134191PS	1203804347	060917V4\4L524.D	06/09/17	2230
11 CAWA-17-134191PSD	1203804349	060917V4\4L525.D	06/09/17	2259

# Quality Control Data

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

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



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

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

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

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

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

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<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

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

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1645	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

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

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

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

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

SDG Number: 2017-1645

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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**

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<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203806749		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 11:19	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 11:19		
<b>Data File:</b> 060817V4\4L407.D	<b>Column:</b> DB-624	

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

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

**Tentatively Identified Compound Summary**

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

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

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203806750	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1671196	<b>Project:</b> QC
<b>Run Date:</b> 06/08/2017 09:24	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/08/2017 09:24	<b>Dilution:</b> 1
<b>Data File:</b> 060817V4\4L403A.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> VXY1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		46.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		42.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		41.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		42.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		39.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		44.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		42.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		226	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		43.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		246	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		208	ug/L	1.50	5.00
67-64-1	Acetone		263	ug/L	1.50	10.0
75-05-8	Acetonitrile		948	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		42.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1645

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806750</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 09:24</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 09:24</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060817V4\4L403A.D</b>	<b>Column:</b>	<b>DB-624</b>

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

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



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806751</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 10:50</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 10:50</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060817V4\4L406A.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		256	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

SDG Number: 2017-1645

Matrix: WATER

Lab Sample ID: 1203806751

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: LCS for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 10:50

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 10:50

Data File: 060817V4\4L406A.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		257	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		259	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		264	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		248	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b>	2017-1645	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203806751		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/08/2017 10:50	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/08/2017 10:50		
<b>Data File:</b>	060817V4\4L406A.D	<b>Column:</b>	DB-624

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

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

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

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203807982	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1671196	<b>Project:</b> QC
<b>Run Date:</b> 06/09/2017 14:42	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/09/2017 14:42	<b>Dilution:</b> 1
<b>Data File:</b> 060917V4\4L508.D	<b>Purge Vol:</b> 5 mL
	<b>Column:</b> DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1645</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203807982</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>MB for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/09/2017 14:42</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/09/2017 14:42</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>060917V4\4L508.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.21	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807982		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:42		
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624	

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

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

**Tentatively Identified Compound Summary**

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

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

<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203807986	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1671196	<b>Project:</b> QC
<b>Run Date:</b> 06/09/2017 14:13	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 06/09/2017 14:13	<b>Dilution:</b> 1
<b>Data File:</b> 060917V4\4L507A.D	<b>Purge Vol:</b> 5 mL
	<b>Column:</b> DB-624

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

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

<b>SDG Number:</b> 2017-1645		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807986			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:13			
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624		

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



**Volatile  
Certificate of Analysis  
Sample Summary**

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<b>SDG Number:</b> 2017-1645	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807986		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:13		
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624	

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

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

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1645  
Work Order #: 424739**

**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: 1671834

Prep Batch Number: 1671833

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
424739001	424739001 (CAPA-17133354)
1203805879	Interference Check Sample (ICS)
1203805875	Method Blank (MB)
1203805876	Laboratory Control Sample (LCS)
1203805877	424741001(CAPA-17-133353) Matrix Spike (MS)
1203805878	424741001(CAPA-17-133353) 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 424741001 (CAPA-17-133353) was chosen for matrix spike and matrix spike duplicate analysis.

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

The MS recoveries were within the established acceptance limits.

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

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

##### **Internal Standard Area Acceptance**

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

##### **Retention Time**

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

#### **Technical Information**

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

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

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

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

**Manual Integrations**

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

**Method Comments**

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

**Additional Comments**

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

**Perchlorate Isotope Ratio**

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

**System Configuration**

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

**Electronic Packaging Comment**

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

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

### **Chromatographic Columns**

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

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

Dionex: IonPac AG-16 2 x 50 mm.

### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

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

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

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 14 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17133354Date Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 424739001Date Filtered: 07-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	0.261	ug/L		1	07-JUN-17 18:41	per0607018a
	Perchlorate Isotope Ratio			2.98			1	07-JUN-17 18:41	per0607018a
14797-73-0	Perchlorate-101	.05	.2	0.248	ug/L		1	07-JUN-17 18:41	per0607018a
	Perchlorate-O(18)			0.438	ug/L		1	07-JUN-17 18:41	per0607018a

^ 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):** 2017-1645

**Extract Batch Code:** 1671833

**Date Filtered:** 07-JUN-17

**Matrix:** WATER

**Sample ID:** 1203805876

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.209	ug/L	104		85 - 115
Perchlorate Isotope Ratio		2.99				-
Perchlorate-101	0.200	.197	ug/L	99		85 - 115
Perchlorate-O(18)		.47	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):** 2017-1645

**Extract Batch Code:** 1671833

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

**GEL MS/PS ID:** 1203805877

**Client ID:** CAPA-17-133353

**GEL MSD/PSD ID:** 1203805878

**QC Type:** MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.634	ug/L	0.874	120	.806	86	8	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		3.08		2.97		3		-
Perchlorate-101	0.200	0.597	ug/L	0.801	102	.766	85	5	30	75 - 125
Perchlorate-O(18)	0	0.453	ug/L	0.435		.446		3		-

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805875Date Filtered: 07-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	07-JUN-17 17:56	per0607013a
	Perchlorate Isotope Ratio						1	07-JUN-17 17:56	per0607013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate-O(18)			0.465	ug/L		1	07-JUN-17 17:56	per0607013a

^ 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 LLC

Client Sample No.

LCSLab Code: GELDate Received: 07-JUN-17Instrument: LCMSMSGEL Job No (SDG): 2017-1645Method: EPA 6850 ModifiedGEL Sample ID: 1203805876Matrix: WATERDate Filtered: 07-JUN-17Extraction Batch ID: 1671833Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL%Solids:     Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.209	ug/L		1	07-JUN-17 18:05	per0607014a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 18:05	per0607014a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	07-JUN-17 18:05	per0607014a
	Perchlorate-O(18)			0.470	ug/L		1	07-JUN-17 18:05	per0607014a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805879Date Filtered: 07-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	0.199	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate Isotope Ratio			2.89			1	07-JUN-17 18:14	per0607015a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate-O(18)			0.504	ug/L		1	07-JUN-17 18:14	per0607015a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDate Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805877Date Filtered: 07-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	0.874	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate Isotope Ratio			3.08			1	07-JUN-17 18:59	per0607020a
14797-73-0	Perchlorate-101	.05	.2	0.801	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate-O(18)			0.435	ug/L		1	07-JUN-17 18:59	per0607020a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDDate Received: 06-JUN-17GEL Job No (SDG): 2017-1645GEL Sample ID: 1203805878Date Filtered: 07-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	0.806	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate Isotope Ratio			2.97			1	07-JUN-17 19:08	per0607021a
14797-73-0	Perchlorate-101	.05	.2	0.766	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate-O(18)			0.446	ug/L		1	07-JUN-17 19:08	per0607021a

^ 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 #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1671746

Prep Batch Number: 1671745

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) Matrix Spike Duplicate (MSD)

**Preparation/Analytical Method Verification**

**SOP Reference**

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

**Calibration Information**

**Initial Calibration**

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

**Calibration Verification Standard Requirements**

All calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB) and 424739002 (CAPA-17133356) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

**Calibration Blank Requirements**

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria. Due to software limitations, the CCBs and/or the ICBs may

have a concentration for target analytes in the Found column. These values should be zero.

#### **CRI Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

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

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

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

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

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

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

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

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

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

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

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

#### **Technical Information**

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

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

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

All procedures were performed as stated in the SOP.

#### **Sample Dilutions**

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

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

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

#### **Miscellaneous Information**

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

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

##### **Manual Integrations**

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

##### **Additional Comments**

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

#### **System Configuration**

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

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

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

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

#### **Chromatographic Columns**

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

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



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

**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1645 GEL Work Order: 424739

#### 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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUN 2017

Title: Group Leader

# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-133356

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 424739002

Sample Amount 930 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608043.wiff

Date Analyzed: 09-JUN-17 17:46

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.269	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.269	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.269	U	0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.269	U	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.269	U	0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.269	U	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.269	U	0.086	0.269
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.269	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.269	U	0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.269	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.269	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.269	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-133356

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 424739002

Sample Amount 930 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
99-65-0	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.538	U	0.086	0.538
479-45-8	<i>Tetryl</i>				
78-11-5	PETN	.538	U	0.108	0.538
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.08	U	0.323	1.08
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.08	QU	0.323	1.08
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	2.97		0.086	0.269
121-82-4	<i>RDX</i>				

# **Quality Control Summary**

**High Explosives Surrogate Recovery Summary****Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1645**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424739002	CAPA-17-133356	92	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

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

**Lab Name:** GEL Laboratories LLC

**Client ID:** LCS

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1645

**Extract Batch Code:** 1671745

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

**GEL LCS ID:** 1203805556

**GEL LCSDUP ID:** .

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

**DUP Analysis Date/Time:**

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
2,6-Diamino-4-nitrotoluene	5	4.21	84					53 - 127
2,6-Dinitrotoluene	5	5.31	106 *					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.52	90					70 - 112
3,5-Dinitroaniline	5	6.02	120					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.76	95					74 - 116
HMX	5	3.92	78					58 - 113
Nitrobenzene	5	4.52	90					64 - 115
PETN	5	4.8	96					57 - 126
RDX	5	4	80					64 - 117
TATB	2.5	3.76	150 *					47 - 135
Tetryl	5	4.01	80					55 - 122
m-Dinitrobenzene	5	4.66	93					74 - 117
m-Nitrotoluene	5	4.63	93					66 - 114
o-Nitrotoluene	5	4.49	90					64 - 115
p-Nitrotoluene	5	4.84	97					66 - 127
tris(o-cresyl) phosphate	5	3.64	73					43 - 104
1,3,5-Trinitrobenzene	5	4.19	84					70 - 110
2,4,6-Trinitrotoluene	5	4.89	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	3.93	79					50 - 121
2,4-Dinitrotoluene	5	4.41	88					71 - 110

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

\* Values outside of QC limits



**3**  
**High Explosives MS/MSD Summary**

**Lab Name:** GEL Laboratories LLC

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

**Lab Code:** GEL

**GEL Job No (SDG)** 2017-1645

**Extract Batch Code:** 1671745

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

**GEL Spike ID:** 1203805559

**GEL SpikeDup ID:** 1203805560

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

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

**Reporting Units:** ug/L

**QC Type:** MS/MSD

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

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

# Quality Control Data

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.5	U	0.080	0.500
479-45-8	Tetryl				
78-11-5	PETN	.5	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1	QU	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6 <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
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	3.64		0.300	1.00
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	3.76		0.300	1.00
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	3.92		0.080	0.250
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	3.93		0.500	2.50
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	4		0.080	0.250
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	4.01		0.080	0.500
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	4.19		0.080	0.250
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	4.21		0.500	2.50
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	4.41		0.080	0.250
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	4.49		0.082	0.250

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	4.52		0.080	0.250
35572-78-2	2-Amino-4,6-dinitrotoluene				
98-95-3	Nitrobenzene	4.52		0.080	0.250
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	4.63		0.080	0.250
99-08-1	m-Nitrotoluene				
99-65-0	m-Dinitrobenzene	4.66		0.080	0.250
99-65-0	m-Dinitrobenzene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.080	0.250
19406-51-0	4-Amino-2,6-dinitrotoluene				
78-11-5	PETN	4.8		0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	4.84		0.150	0.500
99-99-0	p-Nitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	4.89		0.080	0.250
118-96-7	2,4,6-Trinitrotoluene				
606-20-2	2,6-Dinitrotoluene	5.31		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
618-87-1	3,5-Dinitroaniline	6.02		0.300	1.00
618-87-1	3,5-Dinitroaniline				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.0885	J	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.175	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.68		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.82		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
3058-38-6	TATB	3.88		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
99-08-1	m-Nitrotoluene	4.09		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.27		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.34		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.46		0.0833	0.260
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.49		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
78-11-5	PETN	4.52		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
118-96-7	2,4,6-Trinitrotoluene	4.56		0.0833	0.260
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.61		0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.64		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.0833	0.260
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.8		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.93		0.0833	0.260
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.42		0.521	2.60
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.74		0.521	2.60
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.81		0.313	1.04
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
2691-41-0	HMX	6.44		0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	26.4		0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.164	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.26	U	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.71		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.79		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
99-08-1	m-Nitrotoluene	3.95		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
3058-38-6	TATB	3.97		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
98-95-3	Nitrobenzene	4		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.01		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.11		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
78-11-5	PETN	4.21		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.24		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.26		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1645

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.53		0.0833	0.260
99-65-0	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.59		0.0833	0.260
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.7		0.0833	0.260
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.19		0.0833	0.260
121-14-2	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.32		0.0833	0.260
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.58		0.521	2.60
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.72		0.313	1.04
618-87-1	<i>3,5-Dinitroaniline</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.16		0.521	2.60
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	6.47		0.0833	0.260
2691-41-0	<i>HMX</i>				
121-82-4	RDX	22.2		0.0833	0.260
121-82-4	<i>RDX</i>				

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1645Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1645Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

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

**GEL Data File:** EXP0608010.wiff

**Instrument ID:** LCMSMS5

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

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 09-JUN-17 00:49

GEL Data File: EXP0608014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	3.17

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 09-JUN-17 04:54

GEL Data File: EXP0608021.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 09-JUN-17 07:15

GEL Data File: EXP0608025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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



4A  
Explosives Continuing Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK06

**Analysis Date:** 09-JUN-17 08:25

**GEL Data File:** EXP0608027.wiff

**Instrument ID:** LCMSMS5

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

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

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

**GEL Data File:** EXP0608038.wiff

**Instrument ID:** LCMSMS5

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

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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 09-JUN-17 16:01

**GEL Data File:** EXP0608040.wiff

**Instrument ID:** LCMSMS5

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

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A  
Explosives Continuing Calibration Blank

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1645

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 09-JUN-17 22:27

**GEL Data File:** EXP0608051.wiff

**Instrument ID:** LCMSMS5

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

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 10-JUN-17 03:42

GEL Data File: EXP0608060.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1645

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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

# Miscellaneous



### DATA EXCEPTION REPORT

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

**Originator's Name:**

Charles Wilson 14-JUN-17

**Data Validator/Group Leader:**

Michael Penny 14-JUN-17

# **Metals Analysis**

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1645**  
**Work Order #: 424739**

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
424739002	CAPA-17133356
1203805071	Method Blank (MB) <b>ICP</b>
1203805072	Laboratory Control Sample (LCS)
1203805075	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805073	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805074	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805126	Method Blank (MB) <b>ICP-MS</b>
1203805127	Laboratory Control Sample (LCS)
1203805130	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805128	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805129	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203810085	Method Blank (MB) <b>CVAA</b>
1203810086	Laboratory Control Sample (LCS)
1203810092	424739001(CAPA-17133354L) Serial Dilution (SD)
1203810088	424739001(CAPA-17133354D) Sample Duplicate (DUP)
1203810090	424739001(CAPA-17133354S) Matrix Spike (MS)

**Sample Analysis**

Samples 424739001 and 002 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1671565, 1671589, 1673477 and 1677435
<b>Prep Batch :</b>	1671563, 1671587 and 1673474
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

**Preparation/Analytical Method Verification**

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

**System Configuration**

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

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

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

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X ICPMS. The instrument is equipped with a ESI PFA-ST nebulizer, quadrupole mass spectrometer, dual mode electron multiplier detector, and Kinetic Energy Discrimination (KED) technology. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

### **Calibration Information**

#### **Instrument Calibration**

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

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

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium, sodium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 424739001 (CAPA-17133354)-ICP.

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

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

#### **Continuing Calibration Blanks (CCB) Requirements**

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

#### **Continuing Calibration Verification (CCV) Requirements**

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

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

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

The MBs analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

#### **Quality Control (QC) Sample Statement**

The following samples were selected as the quality control (QC) samples for this SDG: 424741001 (CAPA-17-133353)-ICP and ICP-MS and 424739001 (CAPA-17133354)-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: 2017-1645 GEL Work Order: 424739

#### **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: 26 JUN 2017**

**Title: Data Validator**



# **Sample Data Summary**

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424739001**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133354**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:37	061417W1-7	1673477

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

SDG No: 2017-1645

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424739001

BASIS: As Received

DATE COLLECTED 01-JUN-17

CLIENT ID: CAPA-17133354

LEVEL: Low

DATE RECEIVED 06-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	06/14/17 18:09	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-39-3	Barium	19.9	ug/L		1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-70-2	Calcium	10100	ug/L		50	200	200	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7439-95-4	Magnesium	3380	ug/L		110	300	300	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7439-98-7	Molybdenum	0.561	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7440-09-7	Potassium	1210	ug/L		50	150	150	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:46	170609-6	1671589
7631-86-9	Silica	57600	ug/L		53	213	213	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:40	170608-2	1671589
7440-23-5	Sodium	9740	ug/L		100	300	300	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-24-6	Strontium	52.3	ug/L		1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-61-1	Uranium	0.386	ug/L		0.067	0.2	0.2	1	MS	PRB	06/09/17 00:52	170608-5	1671589
7440-62-2	Vanadium	2.65	ug/L	J	1	5	5	1	P	HSC	06/14/17 18:09	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 18:09	061417A-1	1671565

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424739001**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133354**LEVEL:** Low**DATE RECEIVED** 06-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	39.2	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1671565	1671563	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1671589	1671587	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1673477	1673474	EPA 245.1/245.2 Prep	20	mL	20	mL	06/13/17	AXS5

**\*Analytical Methods:**

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

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

**SDG No:** 2017-1645**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424739002**BASIS:** As Received**DATE COLLECTED** 01-JUN-17**CLIENT ID:** CAPA-17133356**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:49	061417W1-7	1673477

**Prep Information:**

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

**\*Analytical Methods:**

AV EPA 245.2 1974

# **Quality Control Summary**

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

SDG NO. 2017-1645

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>
1203805071	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	-4.22	ug/L	+/-10	J	P	3.3	10
1203805126	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
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1645

Client ID: CAPA-17-133353S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 424741001

Spike ID: 1203805074

<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	5750		664		5000	102		P
Barium	ug/L	75-125	548		56.6		500	98.3		P
Beryllium	ug/L	75-125	498		1	U	500	99.6		P
Boron	ug/L	75-125	531		17.3	J	500	103		P
Calcium	ug/L	75-125	20700		15700		5000	99.5		P
Cobalt	ug/L	75-125	491		1	U	500	98.3		P
Copper	ug/L	75-125	520		3	U	500	104		P
Iron	ug/L	75-125	5370		325		5000	101		P
Magnesium	ug/L	75-125	9090		4110		5000	99.4		P
Manganese	ug/L	75-125	493		2	U	500	98.3		P
Potassium	ug/L	75-125	8010		2930		5000	102		P
Silica	ug/L	75-125	51700		40500		10700	105		P
Sodium	ug/L	75-125	25600		19600		5000	119		P
Strontium	ug/L	75-125	601		95.7		500	101		P
Tin	ug/L	75-125	496		2.5	U	500	98.8		P
Vanadium	ug/L	75-125	511		3.28	J	500	101		P
Zinc	ug/L	75-125	469		3.3	U	500	93.8		P

## \*Analytical Methods:

P SW846 3005A/6010C



## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17-133353S

**Contract:** ESHL00114 **Level:** Low

**Matrix:** WATER **% Solids:**

**Sample ID:** 424741001 **Spike ID:** 1203805129

<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>
Uranium	ug/L	75-125	46.6		0.184	J	50	92.8		MS
Antimony	ug/L	75-125	50.1		1	U	50	99.8		MS
Arsenic	ug/L	75-125	52		2	U	50	100		MS
Cadmium	ug/L	75-125	49.9		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	49.6		3	U	50	97.4		MS
Lead	ug/L	75-125	47.4		0.5	U	50	94.5		MS
Molybdenum	ug/L	75-125	51.9		0.948		50	102		MS
Nickel	ug/L	75-125	49.1		0.812	J	50	96.5		MS
Selenium	ug/L	75-125	47		2	U	50	92		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	43.9		0.6	U	50	87.8		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17133354S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 424739001 **Spike ID:** 1203810090

<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	2.09		0.067	U	2	104		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

**Metals**  
**–6–**  
**Duplicate Sample Summary**

SDG No.: 2017–1645

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–17–133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805073

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	664		647		2.55		P
Barium	ug/L	+/-20%	56.6		56		1.16		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	17.3 J		16.2 J		6.54		P
Calcium	ug/L	+/-20%	15700		15500		1.48		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	325		324		.401		P
Magnesium	ug/L	+/-20%	4110		4050		1.64		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	2930		2870		2.21		P
Silica	ug/L	+/-20%	40500		39700		2.01		P
Sodium	ug/L	+/-20%	19600		20000		1.78		P
Strontium	ug/L	+/-20%	95.7		94.9		.858		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	3.28 J		2.3 J		34.9		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2017-1645

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805128

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.948		0.933		1.59		MS
Nickel	ug/L		0.812 J		0.6 U		200		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	0.184 J		0.177 J		3.88		MS

\*Analytical Methods:

MS SW846 3005A/6020A

**Metals**  
**–6–**  
**Duplicate Sample Summary**

**SDG No.:** 2017–1645**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAPA–17133354D**Matrix:** WATER**Level:** Low**Sample ID:** 424739001**Duplicate ID:** 1203810088**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1645

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>
1203805072								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5070		101	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	520		104	80-120	P
	Iron	ug/L	5000	5120		102	80-120	P
	Magnesium	ug/L	5000	5170		103	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5150		103	80-120	P
	Silica	ug/L	10700	10600		99.1	80-120	P
	Sodium	ug/L	5000	5490		110	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	499		99.9	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	479		95.8	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1645

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>
1203805127								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	53.3		107	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	51.8		104	80-120	MS
	Lead	ug/L	50	49.5		99	80-120	MS
	Molybdenum	ug/L	50	49.8		99.6	80-120	MS
	Nickel	ug/L	50	51.9		104	80-120	MS
	Selenium	ug/L	50	51.2		102	80-120	MS
	Silver	ug/L	50	50.7		101	80-120	MS
	Thallium	ug/L	50	45.1		90.3	80-120	MS
	Uranium	ug/L	50	47.2		94.5	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Laboratory Control Sample Summary

SDG NO. 2017-1645

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203810086	Mercury	ug/L	2	2.04		102	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2



## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1645 Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 424741001 Serial Dilution ID: 1203805075

<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	664		679	J	2.358			P
Barium	56.6		57.7		1.911		10	P
Beryllium	1	U	5	U				P
Boron	17.3	J	75	U	52.718			P
Calcium	15700		16100		2.573		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	325		339	J	4.313			P
Magnesium	4110		4070		1.058			P
Manganese	2	U	10	U				P
Potassium	2930		3030		3.494		10	P
Silica	40500		40100		.913		10	P
Sodium	19600		20700		5.351		10	P
Strontium	95.7		98.4		2.825		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.28	J	5	U	135.167			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1645

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805130

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.948		1.15	J	20.781			MS
Nickel	.812	J	5.81	J	614.901			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.184	J	.335	U	2.174			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2017-1645 **Client ID:** CAPA-17133354L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424739001 **Serial Dilution ID:** 1203810092

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

## \*Analytical Methods:

AV EPA 245.1/245.2

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1645  
Work Order #: 424739**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1671529

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805981	Method Blank (MB)
1203805982	Laboratory Control Sample (LCS)
1203805984	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805986	424739002(CAPA-17133356) Post Spike (PS)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 15.

**Preparation/Analytical Method Verification**

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

**Calibration Information**

The Carbon analysis was performed on a O-I Analytical 1030W Carbon Analyzer.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

acceptance limits.

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 424739002 (CAPA-17133356) was selected for QC analysis.

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

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

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

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Preservation/Integrity**

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

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

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

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

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

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



### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1671534	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1671533	<b>Method:</b>	EPA 335.4

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203805008	Method Blank (MB)
1203805009	Laboratory Control Sample (LCS)
1203805010	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805012	424739002(CAPA-17133356) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **Y Intercept Rule**

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

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

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424739002 (CAPA-17133356) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

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

### **Method/Analysis Information**

**Product:** Ion Chromatography

**Analytical Batch:** 1671680

**Method:** WSP-ANIONS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805353	Method Blank (MB)
1203805354	Laboratory Control Sample (LCS)
1203805355	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805356	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) 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 1203805355 (CAWA-17-134176DUP) and 1203805356 (CAWA-17-134176PS) 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**

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

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

#### **Manual Integrations**

Samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS) and 424739001 (CAPA-17133354) 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**

<b>Product:</b>	<b>Ammonia Nitrogen</b>		
<b>Analytical Batch:</b>	1671935	<b>Method:</b>	NH3
<b>Prep Batch :</b>	1671933	<b>Method:</b>	EPA 350.1 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806101	Method Blank (MB)
1203806102	Laboratory Control Sample (LCS)
1203806103	424741001(CAPA-17-133353) Sample Duplicate (DUP)
1203806104	424741001(CAPA-17-133353) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

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

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

acceptance limits.

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424741001 (CAPA-17-133353) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.



**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1671942	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1671941	<b>Method:</b>	EPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739002	CAPA-17133356
1203806126	Method Blank (MB)
1203806127	Laboratory Control Sample (LCS)
1203806128	424741002(CAPA-17-133355) Sample Duplicate (DUP)
1203806129	424741002(CAPA-17-133355) 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 424741002 (CAPA-17-133355) 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 1203806126 (MB) and 1203806127 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1671832

**Method:** NO3NO2

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805863	Method Blank (MB)
1203805864	Laboratory Control Sample (LCS)
1203805866	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805867	424853003(NonSDG) Sample Duplicate (DUP)
1203805871	424735002(CAWA-17-134176) Post Spike (PS)
1203805872	424853003(NonSDG) 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**

Samples 424735002 (CAWA-17-134176) and 424853003 (NonSDG) were selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1671937	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1671936	<b>Method:</b>	EPA 365.4 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806112	Method Blank (MB)
1203806113	Laboratory Control Sample (LCS)
1203806120	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203806121	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

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

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

#### **Technical Information**

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

##### **Holding Times**

All samples in this SDG met the specified holding time.

##### **Sample Preservation/Integrity**

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

##### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

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

##### **Additional Comments**

Additional comments were not required for this SDG.

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

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

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

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

### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1671665

**Method:** TDS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805322	Method Blank (MB)
1203805323	Laboratory Control Sample (LCS)
1203805324	424739001(CAPA-17133354) 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 424739001 (CAPA-17133354) was selected for QC analysis.

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

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

Analyte	Sample	Value
Total Dissolved Solids	1203805324 (CAPA-17133354DUP)	13.3* (0%-5%)

#### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

#### **Miscellaneous Information**

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

A data exception report (DER) 1640819 was generated for sample 1203805324 (CAPA-17133354DUP) in this SDG/batch.

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1671823

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

### **Calibration Verification Information**

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

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1671988 **Method:** PH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

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

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

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424739001 (CAPA-17133354)	pH	Received 06-JUN-17, out of holding 01-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****Data Exception (DER) Documentation**

A data exception report (DER) 1640886 was generated for samples 424739001 (CAPA-17133354) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1671987      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424739001	CAPA-17133354
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

#### **Quality Control (QC) Designation**

Sample 424747001 (CAWA-17-133332) was selected for QC analysis.

**Matrix Spike (MS)/Post Spike (PS) Recovery Statement**

The MS/PS recovery for this sample set was within the required acceptance limits where applicable.

**Duplicate Relative Percent Difference (RPD) Statement**

The RPD between the sample and its duplicate met the acceptance limits.

**Technical Information**

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The samples in this SDG did not require re-analysis.

**Miscellaneous Information**

**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

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**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

## GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### Qualifier Definition Report for

ARSL004 ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)

Client SDG: 2017-1645 GEL Work Order: 424739

#### 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: 22 JUN 2017

Title: Analyst I

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 22, 2017

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1645

Client Sample ID: CAPA-17133354  
Sample ID: 424739001  
Matrix: W  
Collect Date: 01-JUN-17 13:35  
Receive Date: 06-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	06/06/17	2210	1671680	1
Chloride		1.34	0.067	0.200	mg/L		1					
Fluoride	J	0.0724	0.033	0.100	mg/L		1					
Sulfate		2.07	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0939	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1007	1671935	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.615	0.017	0.050	mg/L		1	AXH3	06/09/17	1009	1671832	3
PO4 "As Received"												
Phosphorus, Total as P		0.055	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1322	1671937	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		149	3.40	14.3	mg/L			KLP1	06/08/17	1627	1671665	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		55.8	1.45	4.00	mg/L			RXB5	06/09/17	1342	1671987	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		139	1.00	1.00	umhos/cm		1	VH1	06/08/17	1100	1671823	7
PH "As Received"												
pH at Temp 10.2C	H	7.85	0.010	0.100	SU		1	RXB5	06/09/17	1340	1671988	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1671933
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/08/17	1700	1671936

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 22, 2017

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1645

Client Sample ID: CAPA-17133354  
Sample ID: 424739001

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
The following Analytical Methods were performed:												
Method	Description		Analyst Comments									
1	EPA:300.0											
2	EPA:350.1											
3	EPA:353.2											
4	EPA 365.4 1974											
5	EPA:160.1											
6	EPA:310.1											
7	EPA:120.1											
8	EPA 150.1 1982											

### Notes:

#### Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: June 22, 2017

Company : Los Alamos National Laboratory  
Address : TA-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545  
Contact: Mr. Keith Greene  
Project: LANL- WQH Water Samples

Client SDG: 2017-1645

Client Sample ID: CAPA-17133356  
Sample ID: 424739002  
Matrix: W  
Collect Date: 01-JUN-17 13:35  
Receive Date: 06-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	J	0.455	0.330	1.00	mg/L		1	TSM	06/09/17	0310	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	1000	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.154	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1505	1671942	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0842	1671533
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/08/17	1700	1671941

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

# **Quality Control Summary**



# GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: June 22, 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: 424739

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1671529										
QC1203805984	424739002	DUP									
Total Organic Carbon Average		J	0.455	J	0.416	mg/L	8.96	^	(+/-1.00)	TSM	06/09/17 03:57
QC1203805982	LCS										
Total Organic Carbon Average	10.0				10.6	mg/L			106	(80%-120%)	06/09/17 00:26
QC1203805981	MB										
Total Organic Carbon Average				U	ND	mg/L					06/09/17 00:15
QC1203805986	424739002	PS									
Total Organic Carbon Average	10.0	J	0.455		11.6	mg/L			111	(75%-125%)	06/09/17 04:44
<b>Flow Injection Analysis</b>											
Batch	1671534										
QC1203805010	424739002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			AXH3	06/07/17 10:01
QC1203805009	LCS										
Cyanide, Total	50.0				51.6	ug/L			103	(90%-110%)	06/07/17 09:48
QC1203805008	MB										
Cyanide, Total				U	ND	ug/L					06/07/17 09:47
QC1203805012	424739002	MS									
Cyanide, Total	100	U	ND		106	ug/L			106	(90%-110%)	06/07/17 10:02
<b>Ion Chromatography</b>											
Batch	1671680										
QC1203805355	424735002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A			MXL2	06/06/17 20:43

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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1671680										
Chloride		15.2		15.2	mg/L	0.0289		(0%-20%)	MXL2	06/08/17	04:23
Fluoride		0.161		0.160	mg/L	1.06	^	(+/-0.100)		06/06/17	20:43
Sulfate		7.13		6.96	mg/L	2.31		(0%-20%)			
QC1203805354 LCS											
Bromide	1.25			1.23	mg/L		98.5	(80%-120%)		06/06/17	19:45
Chloride	5.00			4.61	mg/L		92.3	(80%-120%)			
Fluoride	2.50			2.37	mg/L		94.9	(80%-120%)			
Sulfate	10.0			9.58	mg/L		95.8	(80%-120%)			
QC1203805353 MB											
Bromide			U	ND	mg/L					06/06/17	19:17
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203805356 424735002 PS											
Bromide	1.25	U	ND	1.23	mg/L		98.8	(75%-125%)		06/06/17	21:12
Chloride	5.00		7.60	13.1	mg/L		111	(75%-125%)		06/08/17	04:52
Fluoride	2.50		0.161	2.50	mg/L		93.4	(75%-125%)		06/06/17	21:12
Sulfate	10.0		7.13	17.2	mg/L		101	(75%-125%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1671832										
QC1203805866	424735002	DUP									
Nitrogen, Nitrate/Nitrite	J	0.0222	J	0.0219	mg/L	1.36	^	(+/-0.050)	AXH3	06/09/17	10:00
QC1203805867	424853003	DUP									
Nitrogen, Nitrate/Nitrite		1.12		1.11	mg/L	0.897		(0%-20%)		06/09/17	10:28
QC1203805864	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.997	mg/L		99.7	(90%-110%)		06/09/17	09:52
QC1203805863	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					06/09/17	09:51
QC1203805871	424735002	PS									
Nitrogen, Nitrate/Nitrite	1.00	J	0.0222	1.02	mg/L		99.8	(90%-110%)		06/09/17	10:01
QC1203805872	424853003	PS									
Nitrogen, Nitrate/Nitrite	1.00		1.12	2.04	mg/L		92	(90%-110%)		06/09/17	10:29
Batch	1671935										
QC1203806103	424741001	DUP									
Nitrogen, Ammonia		0.0858		0.0733	mg/L	15.7	^	(+/-0.050)	KLP1	06/09/17	10:13
QC1203806102	LCS										
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)		06/09/17	10:02
QC1203806101	MB										
Nitrogen, Ammonia			J	0.0385	mg/L					06/09/17	10:01
QC1203806104	424741001	MS									
Nitrogen, Ammonia	1.00		0.0858	1.03	mg/L		94.4	(90%-110%)		06/09/17	10:14
Batch	1671937										
QC1203806120	424735002	DUP									
Phosphorus, Total as P		0.0744		0.0757	mg/L	1.73	^	(+/-0.050)	KLP1	06/09/17	13:20

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1671937										
QC1203806113	LCS										
Phosphorus, Total as P	1.00			0.848	mg/L		84.8	(80%-124%)	KLP1	06/09/17	13:07
QC1203806112	MB										
Phosphorus, Total as P			U	ND	mg/L					06/09/17	13:06
QC1203806121	424735002	MS									
Phosphorus, Total as P	1.00	0.0744		1.03	mg/L		95.6	(63%-139%)		06/09/17	13:21
Batch	1671942										
QC1203806128	424741002	DUP									
Nitrogen, Total Kjeldahl		0.336		0.308	mg/L	8.7	^	(+/-0.100)	KLP1	06/09/17	15:06
QC1203806127	LCS										
Nitrogen, Total Kjeldahl	1.00			0.953	mg/L		95.3	(90%-110%)		06/09/17	15:14
QC1203806126	MB										
Nitrogen, Total Kjeldahl			J	0.0715	mg/L					06/09/17	15:13
QC1203806129	424741002	MS									
Nitrogen, Total Kjeldahl	1.00	0.336		1.35	mg/L		101	(90%-110%)		06/09/17	15:07
<b>Solids Analysis</b>											
Batch	1671665										
QC1203805324	424739001	DUP									
Total Dissolved Solids		149		130	mg/L	13.3*		(0%-5%)	KLP1	06/08/17	16:27
QC1203805323	LCS										
Total Dissolved Solids	300			297	mg/L		99	(95%-105%)		06/08/17	16:27
QC1203805322	MB										
Total Dissolved Solids			U	ND	mg/L					06/08/17	16:27

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## QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1671823										
QC1203805835	424596002	DUP									
Conductivity		236		233	umhos/cm	1.28		(0%-10%)	VH1	06/08/17	10:57
QC1203805836	424747001	DUP									
Conductivity		157		156	umhos/cm	0.639		(0%-10%)		06/08/17	11:04
QC1203805834	LCS										
Conductivity	1410			1400	umhos/cm		99.2	(95%-105%)		06/08/17	10:45
Batch	1671987										
QC1203806285	424747001	DUP									
Alkalinity, Total as CaCO3		58.6		59.0	mg/L	0.68		(0%-20%)	RXB5	06/09/17	13:58
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203806283	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		06/09/17	13:09
QC1203806287	424747001	MS									
Alkalinity, Total as CaCO3	100	58.6		165	mg/L		107	(80%-120%)		06/09/17	13:59
Batch	1671988										
QC1203806296	424596002	DUP									
pH	H	7.26	H	7.27	SU	0.138		(0%-5%)	RXB5	06/09/17	13:23
QC1203806295	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		06/09/17	13:08

- Notes:**
- < Result is less than value reported
  - > Result is greater than value reported
  - B The target analyte was detected in the associated blank.
  - E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
  - H Analytical holding time was exceeded

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J											
J											
N/A											
N1											
ND											
NJ											
Q											
R											
R											
U											
X											
Z											
^											
d											
e											
h											

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

\* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

# Miscellaneous

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 09-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> BALANCE ANALYTICAL	<b>Test / Method:</b> EPA 160.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1671665	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424739(2017-1645),424741(2017-1644)</b> <b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Failed RPD for DUP: QC   1203805324DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: Total Dissolved Solids 1203805324 (CAPA-17133354DUP) [13.3* (0%-5%)].	

**Originator's Name:**  
Kristen Mizzell      09-JUN-17

**Data Validator/Group Leader:**  
Aubrey Kingsbury      12-JUN-17



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 10-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GELC
<b>Batch ID:</b> 1671988	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 424296,424297,424596(2017-1633),424735(2017-1647),424739(2017-1645),424741(2017-1644),424747(2017-1649) <b>Application Issues:</b> Sample received out of holding Sample Logged out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Logged out of Holding: 424296 001  2. Sample received out of holding: 424297 001 424596 002,003,007,010 424735 002,004 424739 001 424741 001,003,006,008,009 424747 001 QC 1203806296DUP,1203806297DUP		1. Sample (See Below) was logged in for this analysis outside of the method specified holding time. The data is qualified. 424296001 (Rad Pyridine 7647) [Logged 30-MAY-17, out of holding 30-MAY-17].  2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203806296 (CAWA-17-133306DUP) [Received 02-JUN-17, out of holding 31-MAY-17]. 1203806297 (CAWA-17-13332DUP) [Received 06-JUN-17, out of holding 02-JUN-17]. 424297001 (Non-Rad Pyridine 7856) [Received 30-MAY-17, out of holding 30-MAY-17]. 424596002 (CAWA-17-133306) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596003 (CAWA-17-133334) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596007 (CAWA-17-134191) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596010 (CAWA-17-133316) [Received 02-JUN-17, out of holding 31-MAY-17]. 424735002 (CAWA-17-134176) [Received 06-JUN-17, out of holding 02-JUN-17]. 424735004 (CAWA-17-133309) [Received 06-JUN-17, out of holding 02-JUN-17]. 424739001 (CAPA-17133354) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741001 (CAPA-17-133353) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741003 (CAPA-17-133360) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741006 (CAWA-17-133318) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741008 (CAPA-17-133358) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741009 (CAPA-17-133359) [Received 06-JUN-17, out of holding 01-JUN-17]. 424747001 (CAWA-17-133332) [Received 06-JUN-17, out of holding 02-JUN-17].	

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17