

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:

[illegible]

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139147

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	07/14/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:13		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-51 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

## SAMPLE COMMENTS:

gusty wind while sampling  
sampled 50 ft from generator

## LOCATION COMMENTS:

None

## FIELD PARAMETERS:

Sample Time	12:13	HH:MM	Dissolved Oxygen	7.45 mg/L	Flow (in gpm)	3.75
Oxidation-Reduction Potential	248.2 mV		pH	7.86 SU	Specific Conductance	117.9 $\mu S/cm$
Temperature	21.1 °C		Turbidity	1.09 NTU		

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 07/14/2017 13:30	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/14/17 13:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139160

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	07/14/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:13		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-51 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 2 7/14/17 TS	HCL	Y	NA

## SAMPLE COMMENTS:

none

## LOCATION COMMENTS:

none

## FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 07-14-2017 13:30	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/14/17 13:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

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

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-141868

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	07-14-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	09:15 <del>09:40</del> 07/14/17		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PC	
LOCATION ID:	R-51 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	PEB	
TOP DEPTH:	1		SAMPLE USAGE:	QC	
BOTTOM DEPTH:		X	EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8321A-NMED HEXMOD	1 LITER AMBER GLASS	2 11/14/17	ICE		
	WSP-All Metals	1 LITER POLY	1	HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4		
X	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	X	Y

**SAMPLE COMMENTS:****LOCATION COMMENTS:****FIELD PARAMETERS:**

Sample Time \_\_\_\_\_ HH:MM \_\_\_\_\_ Dissolved Oxygen DCU \_\_\_\_\_ Flow (in gpm) \_\_\_\_\_  
 Oxidation-Reduction Potential \_\_\_\_\_ pH 07/14/17 \_\_\_\_\_ Specific Conductance \_\_\_\_\_

**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY****EVENT ID:** 11313**EVENT NAME:** Pajarito (TA-54) MY2017 Q4**SAMPLE ID:** CAPA-17-141868**WORK ORDER:**

Temperature

Turbidity

**COLLECTED BY (PRINT):**

T. Vander Vliet, D. Hughes

<b>RELINQUISHED BY</b> (Printed Name) <i>Dorran Hughes</i> (Signature) <i>[Signature]</i>	<b>Date/Time</b> <i>07-14-2017</i> <i>13:30</i>	<b>RECEIVED BY</b> (Printed Name) <i>S. Sheppard</i> (Signature) <i>[Signature]</i>	<b>Date/Time</b> <i>7/14/17</i> <i>13:30</i>
<b>RELINQUISHED BY</b> (Printed Name) (Signature)	<b>Date/Time</b>	<b>RECEIVED BY</b> (Printed Name) (Signature)	<b>Date/Time</b>

Report Date: 07/06/2017

## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1975

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
428121	EPA:120.1					
428121	EPA:150.1					
428121	EPA:160.1					
428121	EPA:170.0	1		1		
428121	EPA:245.2					
428121	EPA:300.0					
428121	EPA:310.1					
428121	EPA:335.4					
428121	EPA:350.1					
428121	EPA:351.2					
428121	EPA:353.2					
428121	EPA:365.4					
428121	SM:A2340B					
428121	SW-846:6010C					
428121	SW-846:6020					
428121	SW-846:6850					
428121	SW-846:8260B	1		1		
428121	SW-846:8270D					
428121	SW-846:8330B					
428121	SW-846:9060					

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
428121	EPA:120.1	1683487	1683487											1				1			
428121	EPA:150.1	1685419	1685419											1				1			
428121	EPA:160.1	1683492	1683492						1					1				2			
428121	EPA:170.0	NA	NA	1		1															

## DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
428121	EPA:245.2	1683429	1683428						1	1				1				1			
428121	EPA:300.0	1683740	1683740						1					1				1			
428121	EPA:310.1	1685418	1685418							1				1				1			
428121	EPA:335.4	1682987	1682986						1	2				1				2			
428121	EPA:350.1	1683435	1683433						1	2				1				2			
428121	EPA:351.2	1683499	1683498						1	2				1				2			
428121	EPA:353.2	1683412	1683412						1					1				2			
428121	EPA:365.4	1683501	1683500						1	2				1				2			
428121	SM:A2340B	1691311	1691311																		
428121	SW-846:6010C	1683256	1683255						1	1				1				1			
428121	SW-846:6020	1683229	1683228						1	1				1				1			
428121	SW-846:6850	1683852	1683851						1	1	1			1							
428121	SW-846:8260B	1685732	1685732	1		1			2					4							
428121	SW-846:8270D	1683031	1683030						1	1	1			1							
428121	SW-846:8330B	1683817	1683816						1					1	1						
428121	SW-846:9060	1682967	1682967						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-17-141868	428121003	PEB	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-141859	1203833955	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203833954	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-17-141868	1203838700	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203838699	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-141861	1203833967	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203833966	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203833965	MB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141336	1203833968	DUP	1	0	0	0



## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAPA-17-139147	428121001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-17-139160	428121002	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-141868	1203833845	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-141868	1203833846	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203833844	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203833843	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-141859	1203834564	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203834563	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203834562	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-17-141868	1203838683	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-17-141868	1203838687	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203838682	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17-141868	1203833299	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17-141868	1203833300	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203832560	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203832559	MB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141332	1203834020	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141332	1203834022	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-141868	1203833864	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-141868	1203833865	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203833863	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203833862	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203833988	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203833989	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-141868	1203833992	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-141868	1203833994	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203833991	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203833990	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203833993	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203833995	MS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-17-141868	1203833815	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203833814	LCS	0	0	1	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:353.2	GENERAL CHEMISTRY	MB	1203833813	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203834040	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-17-141868	1203833998	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-17-141868	1203834000	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203833997	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203833996	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203833999	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WT_SEP-PO-17-141334	1203834001	MS	0	0	1	0
SM:A2340B	INORGANIC	CAPA-17-141868	428121003	PEB	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-141868	1203833403	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-141868	1203833404	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPA-17-141868	428121003	PEB	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203833402	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203833401	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-17-141868	1203833323	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-17-141868	1203833324	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-17-141868	428121003	PEB	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203833322	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203833321	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-141868	428121003	PEB	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-141859	1203834823	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-141859	1203834824	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203834822	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203834821	MB	1	0	0	0
SW-846:8260B	VOC	CAPA-17-139147	428121001	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-17-139160	428121002	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-17-141868	428121003	PEB	80	3	0	0
SW-846:8260B	VOC	LCS	1203839374	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203839375	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203839376	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203839377	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203839372	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203839373	MB	80	3	0	0
SW-846:8270D	SVOC	CAPA-17-141868	428121003	PEB	80	6	0	0
SW-846:8270D	SVOC	CAWA-17-141872	1203832695	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-141872	1203832696	MSD	0	6	76	0
SW-846:8270D	SVOC	LCS	1203832694	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203832693	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAPA-17-141868	428121004	PEB	23	1	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	LCS	1203834748	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	LCSD	1203834749	LCSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203834747	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17-141868	428121003	PEB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-141863	1203832497	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203832495	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203832494	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	1203833401	METHOD BLANK	SW-846:6010C	W	Zinc	-3.81	J	ug/L	10.0
MB	1203833862	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0242	J	mg/L	0.050
CAPA-17-139160	428121002	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAPA-17-141868	1203833862	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0242	mg/L	0.0606		0.050	Y	5	100	Y

## DATA VALIDATION REPORT

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAPA-17-141868	1203833401	METHOD BLANK	SW-846:6010C	Zinc	-3.81	ug/L	10.0	U	10.0	N			

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAPA-17-141868	1203833300		EPA:335.4	Cyanide (Total)	1682986	07-21-2017	W	112		110	90	10		
CAPA-17-141868	1203833300		EPA:335.4	Cyanide (Total)	1682986	07-21-2017	W	112		110	90	10		
WT_SEP-PO-17-141332	1203834022		EPA:335.4	Cyanide (Total)	1682986	07-21-2017	W	115		110	90	10		
WT_SEP-PO-17-141334	1203833995		EPA:351.2	Total Kjeldahl Nitrogen	1683498	07-21-2017	W	130		110	90	10		

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
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## DATA VALIDATION REPORT

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203834748	1203834749	SW-846:8330B	Nitrotoluene[2-]	1683816	07-26-2017	W	107	124	115	64			15	30

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.

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-51 S1	2017-1975	CAPA-17-141868	PEB	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	U		I4	N	0.0606	mg/L	0.0606	mg/L			W	07/14/2017		1683435	VAL	Y
R-51 S1	2017-1975	CAPA-17-141868	PEB	INIT	GENERAL CHEMISTRY	EPA:335.4	Cyanide (Total)	U	JJ	I6b	N	5.00	ug/L	0.005	mg/L			W	07/14/2017		1682987	VAL	Y

### Reason Code

### Description

I4

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

I6b

The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.

## DATA VALIDATION REPORT

### Reason Code

### Description

J\_LAB

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

NQ

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

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
CAPA-17-139147	R-51 S1	REG	EPA:170.0	0	1
CAPA-17-139147	R-51 S1	REG	SW-846:8260B	0	80
CAPA-17-139160	R-51 S1	FTB	EPA:170.0	0	1
CAPA-17-139160	R-51 S1	FTB	SW-846:8260B	0	80
CAPA-17-141868	R-51 S1	PEB	EPA:120.1	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:150.1	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:160.1	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:170.0	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:245.2	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:300.0	0	4
CAPA-17-141868	R-51 S1	PEB	EPA:310.1	0	2
CAPA-17-141868	R-51 S1	PEB	EPA:335.4	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:350.1	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:351.2	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:353.2	0	1
CAPA-17-141868	R-51 S1	PEB	EPA:365.4	0	1
CAPA-17-141868	R-51 S1	PEB	SM:A2340B	0	1
CAPA-17-141868	R-51 S1	PEB	SW-846:6010C	0	17
CAPA-17-141868	R-51 S1	PEB	SW-846:6020	0	11
CAPA-17-141868	R-51 S1	PEB	SW-846:6850	0	1
CAPA-17-141868	R-51 S1	PEB	SW-846:8260B	0	80
CAPA-17-141868	R-51 S1	PEB	SW-846:8270D	0	80
CAPA-17-141868	R-51 S1	PEB	SW-846:8330B	0	23
CAPA-17-141868	R-51 S1	PEB	SW-846:9060	0	1



August 11, 2017

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

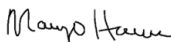
Re: LANL- WQH Water Samples  
Work Order: 428121  
SDG: 2017-1975

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on July 18, 2017, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

  
Margo Herron for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1975  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 428121**  
**SDG: 2017-1975**



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# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 428121  
SDG # : 2017-1975**

**August 11, 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 July 18, 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>
428121001	CAPA-17-139147
428121002	CAPA-17-139160
428121003	CAPA-17-141868
428121004	CAPA-17-141868

**Case Narrative**

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

**Data Package**

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

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



*Margo Herron*  
Margo Herron for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 11 August 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	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-23
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**







Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>428121</u>		
Received By: <u>ZKW</u>		Date Received: <u>7/18/17</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 3480</u>		
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____		
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3		
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. <input checked="" type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other:		
Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs <input type="checkbox"/> Dry ice <input type="checkbox"/> None <input type="checkbox"/> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>2°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Comments (Use Continuation Form if needed):				

PM (or PMA) review: Initials

MEH

Date

7/18/17

Page

1

of 1

GL-CHL-SR-001 Rev 5

SHIP DATE: 17 JUL 17  
ACTWT: 43.0 LB-MAN  
CAD: 0014176/CFE2916

BILL SENDER

ORIGIN ID: SAFA (SOS) 665-9866  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TACO BLDG 1237 OPU 03

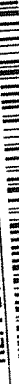
LOS ALAMOS, NM 87545  
UNITED STATES US

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

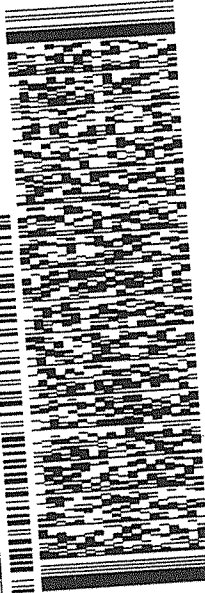
**CHARLESTON SC 29407**

(843) 556-8171

REF: 21PD0ACSWWSSE05WS00



FedEx  
Express

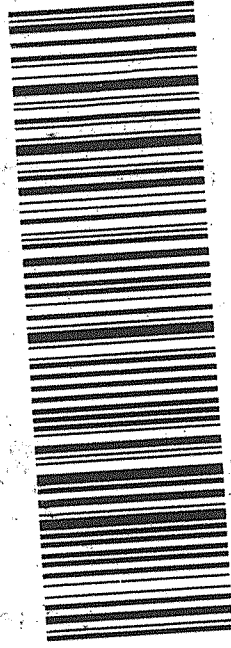


**TUE - 18 JUL 10:30A**  
**PRIORITY OVERNIGHT**

TRK# **5908 1782 3480**

**29407**  
**SC-US CHS**

**X7 RBWA**



Part # 156148V-434 R1T2 06/15 33

# **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 #: 2017-1975  
Work Order #: 428121**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch  
Number: 1685732

**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>
428121001	CAPA-17-139147
428121002	CAPA-17-139160
428121003	CAPA-17-141868
1203839372	Method Blank (MB)
1203839374	Laboratory Control Sample (LCS)
1203839375	Laboratory Control Sample (LCS)
1203839378	428364001(CAPA-17-139144) Post Spike (PS)
1203839379	428364001(CAPA-17-139144) Post Spike (PS)
1203839380	428364001(CAPA-17-139144) Post Spike Duplicate (PSD)
1203839381	428364001(CAPA-17-139144) Post Spike Duplicate (PSD)

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

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

**SOP Reference**

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

**Calibration Information**

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



**Initial Calibration**

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

**Continuing Calibration Verification Requirements**

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

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

Target analytes were detected in the blank 1203839372 (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 428364001 (CAPA-17-139144) was designated for spike analysis.

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

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

**Relative Percent Difference (RPD) Statement**

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

**Internal Standard (ISTD) Acceptance**

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

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

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

**Sample Preservation and Integrity**

All samples met the sample preservation and integrity requirements.

**Sample Dilutions/Methanol Dilutions**

The samples in this SDG did not require dilutions.

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

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

**Miscellaneous Information****Manual Integrations**

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

**TIC Comment**

Tentatively identified compounds (TIC) may be requested for samples 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>
VOA6.I	Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler	HP6890N/HP5975	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: 2017-1975 GEL Work Order: 428121

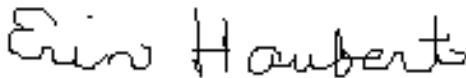
#### The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- 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: 14 AUG 2017

Title: Data Validator

# **Sample Data Summary**

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 428121001

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-139147

Batch ID: 1685732

Run Date: 07/26/2017 13:52

Prep Date: 07/26/2017 13:52

Data File: 072617V6\6R310.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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: 2017-1975

Lab Sample ID: 428121001

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-139147

Batch ID: 1685732

Run Date: 07/26/2017 13:52

Prep Date: 07/26/2017 13:52

Data File: 072617V6\6R310.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 428121001

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17-139147

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 13:52

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 13:52

Data File: 072617V6\6R310.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.3	50.0	ug/L 93	(71%-134%)
Bromofluorobenzene	49.9	50.0	ug/L 100	(70%-131%)
Toluene-d8	47.4	50.0	ug/L 95	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.688	6.2	ug/L	0	J

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

SDG Number: 2017-1975

Lab Sample ID: 428121002

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-139160

Batch ID: 1685732

Run Date: 07/26/2017 14:20

Prep Date: 07/26/2017 14:20

Data File: 072617V6\6R311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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: 2017-1975

Lab Sample ID: 428121002

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-139160

Batch ID: 1685732

Run Date: 07/26/2017 14:20

Prep Date: 07/26/2017 14:20

Data File: 072617V6\6R311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 428121002

Date Collected: 07/14/2017 12:13

Date Received: 07/18/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17-139160

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 14:20

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 14:20

Column: DB-624

Data File: 072617V6\6R311.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	44.7	50.0	ug/L 89	(71%-134%)
Bromofluorobenzene	49.8	50.0	ug/L 100	(70%-131%)
Toluene-d8	47.1	50.0	ug/L 94	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.6	5.28	ug/L	0	J
	unknown siloxane	13.75	5.55	ug/L	0	J

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

SDG Number: 2017-1975

Lab Sample ID: 428121003

Date Collected: 07/14/2017 09:15

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-141868

Batch ID: 1685732

Run Date: 07/26/2017 14:48

Prep Date: 07/26/2017 14:48

Data File: 072617V6\6R312.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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: 2017-1975

Lab Sample ID: 428121003

Date Collected: 07/14/2017 09:15

Date Received: 07/18/2017 09:10

Matrix: W

Client ID: CAPA-17-141868

Batch ID: 1685732

Run Date: 07/26/2017 14:48

Prep Date: 07/26/2017 14:48

Data File: 072617V6\6R312.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 428121003

Date Collected: 07/14/2017 09:15

Date Received: 07/18/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17-141868

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 14:48

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 14:48

Data File: 072617V6\6R312.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	45.8	50.0	ug/L 92	(71%-134%)
Bromofluorobenzene	48.5	50.0	ug/L 97	(70%-131%)
Toluene-d8	46.9	50.0	ug/L 94	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	7.03	ug/L	0	J

# **Quality Control Summary**

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

Page 1 of 1

**SDG Number: 2017-1975****Matrix Type: LIQUID**

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Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203839374	LCS for batch 1685732	103	104	108
1203839375	LCS for batch 1685732	95	95	99
1203839372	MB for batch 1685732	101	104	108
428121001	CAPA-17-139147	93	95	100
428121002	CAPA-17-139160	89	94	100
428121003	CAPA-17-141868	92	94	97
1203839378	CAPA-17-139144PS	102	105	107
1203839380	CAPA-17-139144PSD	92	95	97
1203839379	CAPA-17-139144PS	94	94	98
1203839381	CAPA-17-139144PSD	92	95	99

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**Surrogate****Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(71%-134%)

TOL = Toluene-d8

(74%-124%)

BFB = Bromofluorobenzene

(70%-131%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1685732

Matrix: WATER

Lab Sample ID 1203839374

Instrument: VOA6.I

Analysis Date: 07/26/2017 10:37

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	84.1	84	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1140	91	61-125
67-64-1	LCS Acetone	250	0.0	267	107	48-157
74-88-4	LCS Iodomethane	250	0.0	195	78	72-128
75-15-0	LCS Carbon disulfide	250	0.0	201	81	69-138
108-05-4	LCS Vinyl acetate	250	0.0	312	125	67-125
78-93-3	LCS 2-Butanone	250	0.0	271	108	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	262	105	66-124
591-78-6	LCS 2-Hexanone	250	0.0	291	116	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	41.6	83	40-160
74-87-3	LCS Chloromethane	50.0	0.0	47.1	94	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	48.0	96	65-137
74-83-9	LCS Bromomethane	50.0	0.0	42.6	85	63-137
75-00-3	LCS Chloroethane	50.0	0.0	46.2	92	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	46.3	93	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	49.2	98	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	39.1	78	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	37.3	75	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	45.1	90	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	41.0	82	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	40.6	81	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	42.3	85	75-123



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1685732

Matrix: WATER

Lab Sample ID 1203839374

Instrument: VOA6.I

Analysis Date: 07/26/2017 10:37

Dilution: 1

Analyst: JPI

Purge Vol: 5 mL

Batch ID: 1685732

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	43.1	86	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.5	85	76-125
67-66-3	LCS Chloroform	50.0	0.0	40.0	80	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	40.8	82	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	41.0	82	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	42.6	85	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	40.4	81	74-122
71-43-2	LCS Benzene	50.0	0.0	41.8	84	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	42.2	84	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.8	86	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	43.3	87	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	45.5	91	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	46.6	93	78-131
108-88-3	LCS Toluene	50.0	0.0	41.2	82	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.6	95	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	44.3	89	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.5	85	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	39.4	79	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.5	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	47.0	94	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	41.3	83	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	42.0	84	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1685732

Matrix: WATER

Lab Sample ID 1203839374

Instrument: VOA6.I

Analysis Date: 07/26/2017 10:37

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	42.2	84	74-126
100-42-5	LCS Styrene	50.0	0.0	46.4	93	72-130
75-25-2	LCS Bromoform	50.0	0.0	53.4	107	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	43.7	87	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	47.8	96	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	46.9	94	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	42.0	84	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	42.5	85	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	43.4	87	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	42.3	85	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	42.3	85	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	43.7	87	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	43.5	87	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	43.5	87	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	41.7	83	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	41.2	82	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	41.0	82	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	43.5	87	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	55.4	111	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	41.8	84	72-136
91-20-3	LCS Naphthalene	50.0	0.0	53.2	106	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	45.2	90	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1685732

Matrix: WATER

Lab Sample ID 1203839374

Instrument: VOA6.I

Analysis Date: 07/26/2017 10:37

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	44.7	89	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	44.6	89	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.1	84	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	6040	121	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1685732

Matrix: WATER

Lab Sample ID 1203839375

Instrument: VOA6.I

Analysis Date: 07/26/2017 12:00

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	294	117	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	253	101	61-148
107-05-1	LCS Allyl chloride	250	0.0	238	95	59-125
107-13-1	LCS Acrylonitrile	250	0.0	275	110	65-122
107-12-0	LCS Propionitrile	250	0.0	281	112	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	275	110	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	282	113	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	270	108	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2930	117	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	45.4	91	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1975

Sample Type: Post Spike

Client ID: CAPA-17-139144PS

Matrix: W

Lab Sample ID 1203839378

Instrument: VOA6.I

Analysis Date: 07/26/2017 18:59

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	93.8	94	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1130	90	56-131
67-64-1	PS Acetone	250	0.00 U	150	60	25-155
74-88-4	PS Iodomethane	250	0.00 U	229	92	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	237	95	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	256	103	48-133
78-93-3	PS 2-Butanone	250	0.00 U	160	64	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	235	94	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	176	70	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	37.3	75	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	43.4	87	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	44.0	88	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	50.6	101	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	44.3	89	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	44.0	88	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	45.4	91	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	45.3	91	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	44.2	88	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	48.9	98	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	47.9	96	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	48.2	96	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	49.6	99	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1975

Sample Type: Post Spike

Client ID: CAPA-17-139144PS

Matrix: W

Lab Sample ID 1203839378

Instrument: VOA6.I

Analysis Date: 07/26/2017 18:59

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	48.0	96	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	49.1	98	71-130
67-66-3	PS Chloroform	50.0	0.00 U	48.1	96	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	47.3	95	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	47.1	94	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	49.1	98	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	47.8	96	69-130
71-43-2	PS Benzene	50.0	0.00 U	48.0	96	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	48.7	97	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	49.4	99	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	48.5	97	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	53.0	106	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	51.9	104	70-134
108-88-3	PS Toluene	50.0	0.00 U	47.0	94	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	52.9	106	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	49.5	99	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	48.1	96	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	45.1	90	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	47.2	94	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	52.2	104	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	47.1	94	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	47.6	95	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1975

Sample Type: Post Spike

Client ID: CAPA-17-139144PS

Matrix: W

Lab Sample ID 1203839378

Instrument: VOA6.I

Analysis Date: 07/26/2017 18:59

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	48.1	96	62-131
100-42-5	PS Styrene	50.0	0.00 U	50.9	102	59-135
75-25-2	PS Bromoform	50.0	0.00 U	58.1	116	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	49.3	99	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.9	100	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	49.8	100	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.5	97	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	47.2	94	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	48.5	97	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	48.1	96	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	47.3	95	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	49.3	99	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	48.7	97	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	48.6	97	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	47.6	95	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.0	92	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	45.5	91	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	46.2	92	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	53.2	106	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	43.3	87	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	52.3	105	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	46.1	92	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Post Spike

Client ID: CAPA-17-139144PS

Matrix: W

Lab Sample ID 1203839378

Instrument: VOA6.I

Analysis Date: 07/26/2017 18:59

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	44.7	89	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.7	105	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	47.0	94	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5230	105	60-140



Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Post Spike Duplicate

Client ID: CAPA-17-139144PSD

Matrix: W

Lab Sample ID 1203839380

Instrument: VOA6.I

Analysis Date: 07/26/2017 19:26

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	90.7	91	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1150	92	56-131	2	0-20
67-64-1	PSD Acetone	250	0.00 U	153	61	25-155	2	0-20
74-88-4	PSD Iodomethane	250	0.00 U	225	90	66-133	2	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	230	92	61-141	3	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	259	104	48-133	1	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	167	67	25-143	4	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	246	98	61-127	4	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	185	74	33-138	5	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	35.0	70	33-164	6	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	41.7	83	53-139	4	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	42.7	85	58-140	3	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	48.6	97	59-146	4	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	42.8	86	65-129	3	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	41.9	84	65-141	5	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	45.7	91	69-127	1	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	44.4	89	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	44.0	88	62-123	1	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	50.0	100	69-132	2	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	47.5	95	65-127	1	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	47.5	95	67-127	1	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	49.0	98	69-127	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1975

Sample Type: Post Spike Duplicate

Client ID: CAPA-17-139144PSD

Matrix: W

Lab Sample ID 1203839380

Instrument: VOA6.I

Analysis Date: 07/26/2017 19:26

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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 46.9	94	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 49.0	98	71-130	0	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 47.3	95	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 46.3	93	69-139	2	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 45.8	92	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 48.4	97	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 47.4	95	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00	U 47.1	94	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 47.1	94	65-131	3	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 48.8	98	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 49.2	98	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 52.7	105	70-138	0	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 51.9	104	70-134	0	0-20
108-88-3	PSD Toluene	50.0	0.00	U 46.2	92	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 53.6	107	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 49.5	99	66-125	0	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 48.5	97	67-124	1	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 43.4	87	60-130	4	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 47.9	96	68-143	1	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 52.9	106	71-127	1	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 46.3	93	64-124	2	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 45.9	92	61-130	4	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1975

Sample Type: Post Spike Duplicate

Client ID: CAPA-17-139144PSD

Matrix: W

Lab Sample ID 1203839380

Instrument: VOA6.I

Analysis Date: 07/26/2017 19:26

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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 46.5	93	62-131	3	0-20
100-42-5	PSD Styrene	50.0	0.00	U 49.7	99	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 60.9	122	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 47.7	95	55-133	3	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 51.7	103	62-129	4	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 50.6	101	70-124	2	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 47.6	95	62-124	2	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 45.5	91	50-133	4	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 47.0	94	53-135	3	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 46.7	93	56-128	3	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 46.0	92	53-130	3	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 47.9	96	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 47.1	94	53-132	3	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 46.7	93	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 45.7	91	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 44.6	89	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 44.0	88	55-125	3	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 44.1	88	43-142	5	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 55.2	110	62-141	4	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 42.1	84	40-147	3	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 53.5	107	62-134	2	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	U 46.2	92	52-135	0	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1975

Sample Type: Post Spike Duplicate

Client ID: CAPA-17-139144PSD

Matrix: W

Lab Sample ID 1203839380

Instrument: VOA6.I

Analysis Date: 07/26/2017 19:26

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	44.9	90	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.6	105	71-133	0	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	46.4	93	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	5410	108	60-140	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1975

Sample Type: Post Spike

Client ID: CAPA-17-139144PS

Matrix: W

Lab Sample ID 1203839379

Instrument: VOA6.I

Analysis Date: 07/26/2017 19:55

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	271	108	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	243	97	57-149
107-05-1	PS Allyl chloride	250	0.00 U	231	93	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	262	105	59-129
107-12-0	PS Propionitrile	250	0.00 U	264	106	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	263	105	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	263	105	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	251	100	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2710	108	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	43.7	87	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1975

Sample Type: Post Spike Duplicate

Client ID: CAPA-17-139144PSD

Matrix: W

Lab Sample ID 1203839381

Instrument: VOA6.I

Analysis Date: 07/26/2017 20:23

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1685732

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	257	103	49-141	5	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	247	99	57-149	2	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	234	93	54-128	1	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	254	102	59-129	3	0-20
107-12-0	PSD Propionitrile	250	0.00 U	255	102	58-131	4	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	256	102	59-134	3	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	257	103	62-135	2	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	248	99	60-136	1	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2560	102	60-143	6	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	44.2	88	63-146	1	0-20

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1975	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1685732	Instrument ID:	VOA6.I	Data File:	072617V6\6R308BA.D
Lab Sample ID:	1203839372	Prep Date:	07/26/2017 12:56	Analyzed:	07/26/17 12:56
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 1685732	1203839374	072617V6\6R303LA.D	07/26/17	1037
02 LCS for batch 1685732	1203839375	072617V6\6R306LA.D	07/26/17	1200
03 CAPA-17-139147	428121001	072617V6\6R310.D	07/26/17	1352
04 CAPA-17-139160	428121002	072617V6\6R311.D	07/26/17	1420
05 CAPA-17-141868	428121003	072617V6\6R312.D	07/26/17	1448
06 CAPA-17-139144PS	1203839378	072617V6\6R321.D	07/26/17	1859
07 CAPA-17-139144PSD	1203839380	072617V6\6R322.D	07/26/17	1926
08 CAPA-17-139144PS	1203839379	072617V6\6R323.D	07/26/17	1955
09 CAPA-17-139144PSD	1203839381	072617V6\6R324.D	07/26/17	2023

# Quality Control Data



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

SDG Number: 2017-1975

Matrix: WATER

Lab Sample ID: 1203839372

Client Sample: QC for batch 1685732

Client: ARSL004

Project: QC

Client ID: MB for batch 1685732

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 12:56

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 12:56

Data File: 072617V6\6R308BA.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	J	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

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

<b>SDG Number:</b> 2017-1975	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203839372	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1685732	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1685732	<b>Project:</b> QC
<b>Run Date:</b> 07/26/2017 12:56	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 07/26/2017 12:56	<b>Dilution:</b> 1
<b>Data File:</b> 072617V6\6R308BA.D	<b>Purge Vol:</b> 5 mL
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	J	0.380	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**

<b>SDG Number:</b> 2017-1975	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203839372		
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1685732	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1685732	<b>Inst:</b> VOA6.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/26/2017 12:56	<b>Analyst:</b> JP1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 07/26/2017 12:56		
<b>Data File:</b> 072617V6\6R308BA.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	50.3	50.0	ug/L 101	(71%-134%)
Bromofluorobenzene	53.8	50.0	ug/L 108	(70%-131%)
Toluene-d8	51.8	50.0	ug/L 104	(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> 2017-1975	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203839374	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1685732	<b>Method:</b> SW-846:8260B
<b>Batch ID:</b> 1685732	<b>Project:</b> QC
<b>Run Date:</b> 07/26/2017 10:37	<b>SOP Ref:</b> GL-OA-E-038
<b>Prep Date:</b> 07/26/2017 10:37	<b>Dilution:</b> 1
<b>Data File:</b> 072617V6\6R303LA.D	<b>Purge Vol:</b> 5 mL
	<b>Analyst:</b> JP1
	<b>Column:</b> DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		44.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		40.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.8	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		44.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		40.6	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		39.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		41.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	45.2	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		46.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.7	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		43.5	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		55.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		47.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.1	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		40.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		43.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		41.2	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		41.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		43.1	ug/L	0.300	1.00
78-93-3	2-Butanone		271	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		291	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		42.3	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		41.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		262	ug/L	1.50	5.00
67-64-1	Acetone		267	ug/L	1.50	10.0
75-05-8	Acetonitrile		1140	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		41.8	ug/L	0.300	1.00
108-86-1	Bromobenzene		42.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.5	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		45.5	ug/L	0.300	1.00
75-25-2	Bromoform		53.4	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 1203839374

Client Sample: QC for batch 1685732

Client ID: LCS for batch 1685732

Batch ID: 1685732

Run Date: 07/26/2017 10:37

Prep Date: 07/26/2017 10:37

Data File: 072617V6\6R303LA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		201	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		42.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		41.3	ug/L	0.300	1.00
75-00-3	Chloroethane		46.2	ug/L	0.300	1.00
67-66-3	Chloroform		40.0	ug/L	0.300	1.00
74-87-3	Chloromethane		47.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		41.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		43.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		41.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		49.2	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.0	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	41.8	ug/L	0.300	1.00
74-88-4	Iodomethane		195	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		43.7	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		37.3	ug/L	1.00	10.0
91-20-3	Naphthalene		53.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.4	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		39.4	ug/L	0.300	1.00
108-88-3	Toluene		41.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		42.2	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		312	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		42.3	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		46.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		84.1	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		6040	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.5	ug/L	0.300	1.00
95-47-6	o-Xylene		42.2	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		43.5	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203839374</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1685732</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>
<b>Run Date:</b>	<b>07/26/2017 10:37</b>	<b>Analyst:</b>	<b>JP1</b>
<b>Prep Date:</b>	<b>07/26/2017 10:37</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Data File:</b>	<b>072617V6\6R303LA.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		45.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		43.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		47.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.4	50.0	103	(71%-134%)
Bromofluorobenzene	53.9	50.0	108	(70%-131%)
Toluene-d8	52.0	50.0	104	(74%-124%)

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

SDG Number: 2017-1975

Matrix: WATER

Lab Sample ID: 1203839375

Client Sample: QC for batch 1685732

Client: ARSL004

Project: QC

Client ID: LCS for batch 1685732

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 12:00

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 12:00

Data File: 072617V6\6R306LA.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		45.4	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		294	ug/L	1.50	5.00
107-13-1	Acrylonitrile		275	ug/L	1.50	5.00
107-05-1	Allyl chloride		238	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: 2017-1975

Matrix: WATER

Lab Sample ID: 1203839375

Client Sample: QC for batch 1685732

Client: ARSL004

Project: QC

Client ID: LCS for batch 1685732

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1685732

Inst: VOA6.I

Dilution: 1

Run Date: 07/26/2017 12:00

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 07/26/2017 12:00

Data File: 072617V6\6R306LA.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		270	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		2930	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		275	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		282	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		281	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		253	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	2017-1975	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203839375		
<b>Client Sample:</b>	QC for batch 1685732	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1685732	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1685732	<b>Inst:</b>	VOA6.I
<b>Run Date:</b>	07/26/2017 12:00	<b>Analyst:</b>	JP1
<b>Prep Date:</b>	07/26/2017 12:00	<b>Purge Vol:</b>	5 mL
<b>Data File:</b>	072617V6\6R306LA.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	47.3	50.0	95	(71%-134%)
Bromofluorobenzene	49.6	50.0	99	(70%-131%)
Toluene-d8	47.7	50.0	95	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839378</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 18:59</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 18:59</b>				
<b>Data File:</b>	<b>072617V6\6R321.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		52.7	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		47.3	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.9	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.5	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		48.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		45.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.1	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	46.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.7	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		53.2	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.2	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		49.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		45.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		48.0	ug/L	0.300	1.00
78-93-3	2-Butanone		160	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		48.1	ug/L	0.300	1.00
591-78-6	2-Hexanone		176	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.3	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		235	ug/L	1.50	5.00
67-64-1	Acetone		150	ug/L	1.50	10.0
75-05-8	Acetonitrile		1130	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		48.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.1	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.0	ug/L	0.300	1.00
75-25-2	Bromoform		58.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839378</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 18:59</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 18:59</b>				
<b>Data File:</b>	<b>072617V6\6R321.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		50.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		237	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		49.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.1	ug/L	0.300	1.00
75-00-3	Chloroethane		44.3	ug/L	0.300	1.00
67-66-3	Chloroform		48.1	ug/L	0.300	1.00
74-87-3	Chloromethane		43.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		47.2	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		37.3	ug/L	0.300	1.00
60-29-7	Ethyl ether		45.4	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	43.3	ug/L	0.300	1.00
74-88-4	Iodomethane		229	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		49.3	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		44.2	ug/L	1.00	10.0
91-20-3	Naphthalene		52.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		50.9	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.1	ug/L	0.300	1.00
108-88-3	Toluene		47.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		44.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		256	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		49.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		93.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5230	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.2	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.2	ug/L	0.300	1.00
95-47-6	o-Xylene		48.1	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.6	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/18/2017 10:44	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203839378	<b>Date Received:</b> 07/20/2017 09:10	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPA-17-139144PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1685732	<b>Inst:</b> VOA6.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/26/2017 18:59	<b>Analyst:</b> JP1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 07/26/2017 18:59		
<b>Data File:</b> 072617V6\6R321.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		48.9	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		49.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		52.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.9	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	53.6	50.0	ug/L	107	(70%-131%)
Toluene-d8	52.4	50.0	ug/L	105	(74%-124%)

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/18/2017 10:44	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203839379	<b>Date Received:</b> 07/20/2017 09:10	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPA-17-139144PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1685732	<b>Inst:</b> VOA6.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/26/2017 19:55	<b>Analyst:</b> JP1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 07/26/2017 19:55		
<b>Data File:</b> 072617V6\6R323.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		43.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		271	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		231	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> 2017-1975	<b>Date Collected:</b> 07/18/2017 10:44	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203839379	<b>Date Received:</b> 07/20/2017 09:10	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPA-17-139144PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1685732	<b>Inst:</b> VOA6.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/26/2017 19:55	<b>Analyst:</b> JP1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 07/26/2017 19:55		
<b>Data File:</b> 072617V6\6R323.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		251	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2710	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		263	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		263	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		243	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>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839379</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 19:55</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 19:55</b>				
<b>Data File:</b>	<b>072617V6\6R323.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	47.1	50.0	94	(71%-134%)
Bromofluorobenzene	49.0	50.0	98	(70%-131%)
Toluene-d8	47.0	50.0	94	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839380</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 19:26</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 19:26</b>				
<b>Data File:</b>	<b>072617V6\6R322.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		52.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.3	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		51.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.5	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		47.5	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		44.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		45.8	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	46.2	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.1	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		55.2	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.9	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		46.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		48.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		47.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		44.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		44.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		46.9	ug/L	0.300	1.00
78-93-3	2-Butanone		167	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		46.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		185	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		46.0	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		45.7	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		246	ug/L	1.50	5.00
67-64-1	Acetone		153	ug/L	1.50	10.0
75-05-8	Acetonitrile		1150	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		47.1	ug/L	0.300	1.00
108-86-1	Bromobenzene		47.6	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.7	ug/L	0.300	1.00
75-25-2	Bromoform		60.9	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839380</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 19:26</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 19:26</b>				
<b>Data File:</b>	<b>072617V6\6R322.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		48.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		230	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		48.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.3	ug/L	0.300	1.00
75-00-3	Chloroethane		42.8	ug/L	0.300	1.00
67-66-3	Chloroform		47.3	ug/L	0.300	1.00
74-87-3	Chloromethane		41.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		47.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		35.0	ug/L	0.300	1.00
60-29-7	Ethyl ether		45.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		45.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	42.1	ug/L	0.300	1.00
74-88-4	Iodomethane		225	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.7	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		44.0	ug/L	1.00	10.0
91-20-3	Naphthalene		53.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		49.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		43.4	ug/L	0.300	1.00
108-88-3	Toluene		46.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		47.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		41.9	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		259	ug/L	1.50	5.00
75-01-4	Vinyl chloride		42.7	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		90.7	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5410	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		44.1	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		45.5	ug/L	0.300	1.00
95-47-6	o-Xylene		46.5	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.7	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839380</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 19:26</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 19:26</b>				
<b>Data File:</b>	<b>072617V6\6R322.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		50.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.0	50.0	ug/L	92	(71%-134%)
Bromofluorobenzene	48.6	50.0	ug/L	97	(70%-131%)
Toluene-d8	47.4	50.0	ug/L	95	(74%-124%)

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/18/2017 10:44	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203839381	<b>Date Received:</b> 07/20/2017 09:10	
<b>Client Sample:</b> QC for batch 1685732	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAPA-17-139144PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1685732	<b>Inst:</b> VOA6.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/26/2017 20:23	<b>Analyst:</b> JP1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 07/26/2017 20:23		
<b>Data File:</b> 072617V6\6R324.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		44.2	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		257	ug/L	1.50	5.00
107-13-1	Acrylonitrile		254	ug/L	1.50	5.00
107-05-1	Allyl chloride		234	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>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839381</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 20:23</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 20:23</b>				
<b>Data File:</b>	<b>072617V6\6R324.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		248	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		2560	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		256	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		257	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		255	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		247	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>2017-1975</b>	<b>Date Collected:</b>	<b>07/18/2017 10:44</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203839381</b>	<b>Date Received:</b>	<b>07/20/2017 09:10</b>		
<b>Client Sample:</b>	<b>QC for batch 1685732</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAPA-17-139144PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1685732</b>	<b>Inst:</b>	<b>VOA6.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>07/26/2017 20:23</b>	<b>Analyst:</b>	<b>JP1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>07/26/2017 20:23</b>				
<b>Data File:</b>	<b>072617V6\6R324.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	45.8	50.0	92	(71%-134%)
Bromofluorobenzene	49.5	50.0	99	(70%-131%)
Toluene-d8	47.6	50.0	95	(74%-124%)

# **Semi-Volatile Analysis**

# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1975  
Work Order #: 428121**

**Method/Analysis Information**

<b>Procedure:</b>	<b>Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry</b>
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1683031
Prep Batch Number:	1683030

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
428121003	CAPA-17-141868
1203832693	Method Blank (MB)
1203832694	Laboratory Control Sample (LCS)
1203832695	427997012(CAWA-17-141872) Matrix Spike (MS)
1203832696	427997012(CAWA-17-141872) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

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

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

**Calibration Information**

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



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

#### **Initial Calibration**

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

#### **CCV Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

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

Sample 427997012 (CAWA-17-141872) was selected for analysis as the matrix spike and matrix spike duplicate.

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

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

Sample	Analyte	Value
1203832695 (CAWA-17-141872MS)	Hexachlorocyclopentadiene	23* (26%-79%)
1203832696 (CAWA-17-141872MSD)	Hexachlorocyclopentadiene	23* (26%-79%)

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

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

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

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

#### **Technical Information:**

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

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

associated methodology that assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration.

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

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

#### **Sample Dilutions**

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

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

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

#### **Miscellaneous Information:**

#### **Manual Integrations**

Sample 1203832695 (CAWA-17-141872MS) required manual integration in order to properly identify one or more peaks and/or to correctly position the baseline as set in the calibration standard injections.

#### **TIC Comment**

Tentatively identified compounds (TIC) were requested for sample 428121003 (CAPA-17-141868) in this SDG in this batch.

#### **Additional Comments**

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

#### **Electronic Package Comment**

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

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

#### **System Configuration**

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

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
MSD5.I	Agilent 6890/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

#### **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: 2017-1975 GEL Work Order: 428121

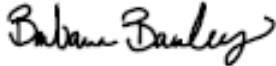
#### The Qualifiers in this report are defined as follows:

- \* 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: Barbara Bailey

Date: 08 AUG 2017

Title: Data Validator

# **Sample Data Summary**

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

**SDG Number:** 2017-1975  
**Lab Sample ID:** 428121003  
  
**Client ID:** CAPA-17-141868  
**Batch ID:** 1683031  
**Run Date:** 07/19/2017 23:41  
**Prep Date:** 07/19/2017 06:45  
**Data File:** s071917.B\s5g1922.D

**Date Collected:** 07/14/2017 09:15  
**Date Received:** 07/18/2017 09:10  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD5.I  
**Analyst:** JLD1  
**Aliquot:** 970 mL  
**Column:** DB-5ms

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

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

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

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SDG Number: 2017-1975

Lab Sample ID: 428121003

Date Collected: 07/14/2017 09:15

Date Received: 07/18/2017 09:10

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1683031

Inst: MSD5.I

Dilution: 1

Run Date: 07/19/2017 23:41

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 07/19/2017 06:45

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s071917.B\s5g1922.D

Column: DB-5ms

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

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

Page 3 of 3

**SDG Number:** 2017-1975  
**Lab Sample ID:** 428121003  
  
**Client ID:** CAPA-17-141868  
**Batch ID:** 1683031  
**Run Date:** 07/19/2017 23:41  
**Prep Date:** 07/19/2017 06:45  
**Data File:** s071917.B\s5g1922.D

**Date Collected:** 07/14/2017 09:15  
**Date Received:** 07/18/2017 09:10  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD5.I  
**Analyst:** JLD1  
**Aliquot:** 970 mL  
**Column:** DB-5ms  
  
**Matrix:** W  
  
**Project:** ESHL00114  
**SOP Ref:** GL-OA-E-009  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	71.6	103	ug/L	69	(32%-124%)
2-Fluorobiphenyl	41.7	51.5	ug/L	81	(32%-112%)
2-Fluorophenol	43.1	103	ug/L	42	(15%-88%)
Nitrobenzene-d5	46.9	51.5	ug/L	91	(36%-115%)
Phenol-d5	28.7	103	ug/L	28	(15%-91%)
p-Terphenyl-d14	44.1	51.5	ug/L	86	(36%-121%)

**Tentatively Identified Compound Summary**

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



# **Quality Control Summary**

Semi-Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1975

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203832693	MB for batch 1683030	41	28	79	73	66	80
1203832694	LCS for batch 1683030	48	32	94	81	86	84
1203832695	CAWA-17-141872MS	36	27	84	66	62	81
1203832696	CAWA-17-141872MSD	30	24	84	67	60	85
428121003	CAPA-17-141868	42	28	91	81	69	86

## Surrogate

## Acceptance Limits

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

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1683030

Matrix: WATER

Lab Sample ID 1203832694

Instrument: MSD5.I

Analysis Date: 07/19/2017 18:13

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	24.7	49	30-88
110-86-1	LCS Pyridine	50.0	0.0	24.5	49	27-89
62-53-3	LCS Aniline	50.0	0.0	38.4	77	49-112
108-95-2	LCS Phenol	50.0	0.0	16.7	33	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	44.4	89	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	37.7	75	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	33.4	67	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	34.1	68	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	34.9	70	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	45.5	91	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	35.1	70	44-102
95-48-7	LCS o-Cresol	50.0	0.0	37.1	74	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	35.5	71	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	44.2	88	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	34.1	68	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	47.2	94	53-115
78-59-1	LCS Isophorone	50.0	0.0	47.1	94	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	40.2	80	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	37.2	74	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	45.5	91	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	41.9	84	53-109
65-85-0	LCS Benzoic acid	100	0.0	30.8	31	21-74

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1683030

Matrix: WATER

Lab Sample ID 1203832694

Instrument: MSD5.I

Analysis Date: 07/19/2017 18:13

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	51.7	103	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	33.2	66	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	42.2	84	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	37.9	76	42-103
91-20-3	LCS Naphthalene	50.0	0.0	38.8	78	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	38.5	77	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	30.6	61	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	41.8	84	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	44.9	90	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	37.4	75	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	49.6	99	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	55.1	110	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	43.2	86	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	45.9	92	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	47.1	94	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	42.2	84	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	43.8	88	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	33.2	66	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	42.1	84	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	42.9	86	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	43.7	87	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	10.9	22	15-137

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1683030

Matrix: WATER

Lab Sample ID 1203832694

Instrument: MSD5.I

Analysis Date: 07/19/2017 18:13

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	42.5	85	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	43.3	87	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	47.3	95	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	37.7	75	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	39.0	78	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	42.5	85	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	39.4	79	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	37.9	76	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	42.5	85	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	41.0	82	55-110
120-12-7	LCS Anthracene	50.0	0.0	41.1	82	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	40.4	81	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	43.6	87	54-118
129-00-0	LCS Pyrene	50.0	0.0	37.7	75	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	37.8	76	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	37.1	74	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	41.7	83	57-112
218-01-9	LCS Chrysene	50.0	0.0	42.1	84	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	35.2	70	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	41.1	82	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	42.0	84	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	41.1	82	40-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1683030

Matrix: WATER

Lab Sample ID 1203832694

Instrument: MSD5.I

Analysis Date: 07/19/2017 18:13

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	43.2	86	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	43.4	87	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	42.6	85	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	27.2	54	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	43.5	87	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	38.7	77	44-102
1912-24-9	LCS Atrazine	50.0	0.0	47.0	94	60-131
92-87-5	LCS Benzidine	100	0.0	78.7	79	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	45.7	91	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	35.8	72	39-99

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1975

Sample Type: Matrix Spike

Client ID: CAWA-17-141872MS

Matrix: W

Lab Sample ID 1203832695

Instrument: MSD5.I

Analysis Date: 07/19/2017 20:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylam	110	0.00 U	59.5	54	25-106
110-86-1	MS Pyridine	110	0.00 U	57.1	52	24-93
62-53-3	MS Aniline	110	0.00 U	89.5	81	37-113
108-95-2	MS Phenol	110	0.00 U	30.2	28	23-82
111-44-4	MS bis(2-Chloroethyl) ether	110	0.00 U	91.4	83	39-114
95-57-8	MS 2-Chlorophenol	110	0.00 U	55.7	51	37-108
541-73-1	MS 1,3-Dichlorobenzene	110	0.00 U	55.1	50	27-97
106-46-7	MS 1,4-Dichlorobenzene	110	0.00 U	55.2	50	28-97
95-50-1	MS 1,2-Dichlorobenzene	110	0.00 U	57.2	52	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	110	0.00 U	92.3	84	32-127
100-51-6	MS Benzyl alcohol	110	0.00 U	81.5	74	37-116
95-48-7	MS o-Cresol	110	0.00 U	56.7	52	34-109
65794-96-9	MS m,p-Cresols	110	0.00 U	57.3	52	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	110	0.00 U	97.8	89	42-118
67-72-1	MS Hexachloroethane	110	0.00 U	56.2	51	29-94
98-95-3	MS Nitrobenzene	110	0.00 U	93.9	85	38-123
78-59-1	MS Isophorone	110	0.00 U	98.7	90	43-120
88-75-5	MS 2-Nitrophenol	110	0.00 U	60.7	55	39-115
105-67-9	MS 2,4-Dimethylphenol	110	0.00 U	58.9	54	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	110	0.00 U	93.5	85	42-118
120-83-2	MS 2,4-Dichlorophenol	110	0.00 U	62.0	56	40-111
65-85-0	MS Benzoic acid	220	0.00 U	58.1	26	17-95

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike

Client ID: CAWA-17-141872MS

Matrix: W

Lab Sample ID 1203832695

Instrument: MSD5.I

Analysis Date: 07/19/2017 20:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	110	0.00	U	110	100	44-138
87-68-3	MS	Hexachlorobutadiene	110	0.00	U	54.0	49	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	110	0.00	U	68.9	63	41-122
91-57-6	MS	2-Methylnaphthalene	110	0.00	U	65.5	60	29-109
91-20-3	MS	Naphthalene	110	0.00	U	66.9	61	31-108
90-12-0	MS	1-Methylnaphthalene	110	0.00	U	65.9	60	33-112
77-47-4	MS	Hexachlorocyclopentadiene	110	0.00	U	25.4	23 *	26-79
88-06-2	MS	2,4,6-Trichlorophenol	110	0.00	U	65.4	59	39-124
95-95-4	MS	2,4,5-Trichlorophenol	110	0.00	U	70.5	64	42-120
91-58-7	MS	2-Chloronaphthalene	110	0.00	U	63.0	57	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	110	0.00	U	106	96	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	110	0.00	U	114	103	42-144
131-11-3	MS	Dimethylphthalate	110	0.00	U	92.9	85	45-128
606-20-2	MS	2,6-Dinitrotoluene	110	0.00	U	96.6	88	46-124
121-14-2	MS	2,4-Dinitrotoluene	110	0.00	U	101	92	45-125
208-96-8	MS	Acenaphthylene	110	0.00	U	78.6	72	35-120
83-32-9	MS	Acenaphthene	110	0.00	U	77.5	70	35-117
51-28-5	MS	2,4-Dinitrophenol	110	0.00	U	48.2	44	27-122
132-64-9	MS	Dibenzofuran	110	0.00	U	76.9	70	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	110	0.00	U	66.8	61	40-128
84-66-2	MS	Diethylphthalate	110	0.00	U	93.1	85	43-127
100-02-7	MS	4-Nitrophenol	110	0.00	U	21.9	20	17-85



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike

Client ID: CAWA-17-141872MS

Matrix: W

Lab Sample ID 1203832695

Instrument: MSD5.I

Analysis Date: 07/19/2017 20:42

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	110	0.00	U	80.4	73	39-117
7005-72-3	MS	4-Chlorophenylphenylether	110	0.00	U	75.9	69	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	110	0.00	U	95.5	87	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	110	0.00	U	54.1	49	32-126
122-39-4	MS	Diphenylamine	110	0.00	U	79.2	72	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	110	0.00	U	80.8	74	38-120
101-55-3	MS	4-Bromophenylphenylether	110	0.00	U	69.7	63	39-121
118-74-1	MS	Hexachlorobenzene	110	0.00	U	70.9	64	40-118
87-86-5	MS	Pentachlorophenol	110	0.00	U	61.4	56	35-121
85-01-8	MS	Phenanthrene	110	0.00	U	79.2	72	40-115
120-12-7	MS	Anthracene	110	0.00	U	80.2	73	38-120
84-74-2	MS	Di-n-butylphthalate	110	0.00	U	86.5	79	41-128
206-44-0	MS	Fluoranthene	110	0.00	U	91.5	83	41-119
129-00-0	MS	Pyrene	110	0.00	U	82.1	75	35-128
85-68-7	MS	Butylbenzylphthalate	110	0.00	U	88.2	80	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	110	0.00	U	89.0	81	38-131
56-55-3	MS	Benzo(a)anthracene	110	0.00	U	89.1	81	39-120
218-01-9	MS	Chrysene	110	0.00	U	87.8	80	41-124
117-84-0	MS	Di-n-octylphthalate	110	0.00	U	89.5	81	37-134
205-99-2	MS	Benzo(b)fluoranthene	110	0.00	U	90.2	82	31-122
207-08-9	MS	Benzo(k)fluoranthene	110	0.00	U	93.4	85	33-123
50-32-8	MS	Benzo(a)pyrene	110	0.00	U	87.4	80	32-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike

Client ID: CAWA-17-141872MS

Matrix: W

Lab Sample ID 1203832695

Instrument: MSD5.I

Analysis Date: 07/19/2017 20:42

Dilution: 1

Analyst: JLD1

Prep Batch ID:1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	110	0.00 U	87.1	79	27-121
53-70-3	MS Dibenzo(a,h)anthracene	110	0.00 U	88.9	81	30-125
191-24-2	MS Benzo(ghi)perylene	110	0.00 U	87.7	80	24-126
123-91-1	MS 1,4-Dioxane	110	0.00 U	62.7	57	24-110
930-55-2	MS N-Nitrosopyrrolidine	110	0.00 U	97.8	89	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	110	0.00 U	63.6	58	32-101
1912-24-9	MS Atrazine	110	0.00 U	85.6	78	42-129
92-87-5	MS Benzidine	220	0.00 U	98.9	45	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	110	0.00 U	94.0	86	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	110	0.00 U	58.8	53	26-102

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-141872MSD

Matrix: W

Lab Sample ID 1203832696

Instrument: MSD5.I

Analysis Date: 07/19/2017 21:12

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylam	110	0.00 U	53.7	49	25-106	10	0-30
110-86-1	MSD Pyridine	110	0.00 U	56.4	51	24-93	1	0-30
62-53-3	MSD Aniline	110	0.00 U	84.9	77	37-113	5	0-30
108-95-2	MSD Phenol	110	0.00 U	26.4	24	23-82	14	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	110	0.00 U	88.4	80	39-114	3	0-30
95-57-8	MSD 2-Chlorophenol	110	0.00 U	54.7	50	37-108	2	0-30
541-73-1	MSD 1,3-Dichlorobenzene	110	0.00 U	52.7	48	27-97	5	0-30
106-46-7	MSD 1,4-Dichlorobenzene	110	0.00 U	52.3	48	28-97	5	0-30
95-50-1	MSD 1,2-Dichlorobenzene	110	0.00 U	56.0	51	28-99	2	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	110	0.00 U	90.6	82	32-127	2	0-30
100-51-6	MSD Benzyl alcohol	110	0.00 U	73.1	67	37-116	11	0-30
95-48-7	MSD o-Cresol	110	0.00 U	54.8	50	34-109	3	0-30
65794-96-9	MSD m,p-Cresols	110	0.00 U	53.5	49	36-120	7	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	110	0.00 U	94.0	86	42-118	4	0-30
67-72-1	MSD Hexachloroethane	110	0.00 U	54.5	50	29-94	3	0-30
98-95-3	MSD Nitrobenzene	110	0.00 U	94.1	86	38-123	0	0-30
78-59-1	MSD Isophorone	110	0.00 U	99.7	91	43-120	1	0-30
88-75-5	MSD 2-Nitrophenol	110	0.00 U	61.3	56	39-115	1	0-30
105-67-9	MSD 2,4-Dimethylphenol	110	0.00 U	58.5	53	39-107	1	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	110	0.00 U	95.5	87	42-118	2	0-30
120-83-2	MSD 2,4-Dichlorophenol	110	0.00 U	63.7	58	40-111	3	0-30
65-85-0	MSD Benzoic acid	220	0.00 U	58.1	26	17-95	0	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-141872MSD

Matrix: W

Lab Sample ID 1203832696

Instrument: MSD5.I

Analysis Date: 07/19/2017 21:12

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	110	0.00 U	109	99	44-138	1	0-30
87-68-3	MSD Hexachlorobutadiene	110	0.00 U	55.1	50	26-98	2	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	110	0.00 U	67.7	62	41-122	2	0-30
91-57-6	MSD 2-Methylnaphthalene	110	0.00 U	66.0	60	29-109	1	0-30
91-20-3	MSD Naphthalene	110	0.00 U	66.8	61	31-108	0	0-30
90-12-0	MSD 1-Methylnaphthalene	110	0.00 U	67.2	61	33-112	2	0-30
77-47-4	MSD Hexachlorocyclopentadiene	110	0.00 U	24.7	23 *	26-79	3	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	110	0.00 U	65.1	59	39-124	1	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	110	0.00 U	71.2	65	42-120	1	0-30
91-58-7	MSD 2-Chloronaphthalene	110	0.00 U	62.3	57	29-113	1	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	110	0.00 U	101	92	41-121	4	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	110	0.00 U	111	101	42-144	3	0-30
131-11-3	MSD Dimethylphthalate	110	0.00 U	92.0	84	45-128	1	0-30
606-20-2	MSD 2,6-Dinitrotoluene	110	0.00 U	96.9	88	46-124	0	0-30
121-14-2	MSD 2,4-Dinitrotoluene	110	0.00 U	95.6	87	45-125	5	0-30
208-96-8	MSD Acenaphthylene	110	0.00 U	78.1	71	35-120	1	0-30
83-32-9	MSD Acenaphthene	110	0.00 U	77.1	70	35-117	0	0-30
51-28-5	MSD 2,4-Dinitrophenol	110	0.00 U	41.5	38	27-122	15	0-30
132-64-9	MSD Dibenzofuran	110	0.00 U	75.6	69	38-113	2	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	110	0.00 U	66.5	61	40-128	0	0-30
84-66-2	MSD Diethylphthalate	110	0.00 U	94.3	86	43-127	1	0-30
100-02-7	MSD 4-Nitrophenol	110	0.00 U	19.8	18	17-85	10	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-141872MSD

Matrix: W

Lab Sample ID 1203832696

Instrument: MSD5.I

Analysis Date: 07/19/2017 21:12

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	110	0.00 U	79.3	72	39-117	1	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	110	0.00 U	73.8	67	39-121	3	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	110	0.00 U	93.5	85	30-133	2	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	110	0.00 U	55.1	50	32-126	2	0-30
122-39-4	MSD Diphenylamine	110	0.00 U	81.5	74	37-118	3	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	110	0.00 U	83.1	76	38-120	3	0-30
101-55-3	MSD 4-Bromophenylphenylether	110	0.00 U	72.6	66	39-121	4	0-30
118-74-1	MSD Hexachlorobenzene	110	0.00 U	74.1	67	40-118	4	0-30
87-86-5	MSD Pentachlorophenol	110	0.00 U	60.5	55	35-121	2	0-30
85-01-8	MSD Phenanthrene	110	0.00 U	80.6	73	40-115	2	0-30
120-12-7	MSD Anthracene	110	0.00 U	81.8	74	38-120	2	0-30
84-74-2	MSD Di-n-butylphthalate	110	0.00 U	88.4	80	41-128	2	0-30
206-44-0	MSD Fluoranthene	110	0.00 U	91.5	83	41-119	0	0-30
129-00-0	MSD Pyrene	110	0.00 U	88.0	80	35-128	7	0-30
85-68-7	MSD Butylbenzylphthalate	110	0.00 U	93.9	85	40-129	6	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	110	0.00 U	93.9	85	38-131	5	0-30
56-55-3	MSD Benzo(a)anthracene	110	0.00 U	92.0	84	39-120	3	0-30
218-01-9	MSD Chrysene	110	0.00 U	91.7	83	41-124	4	0-30
117-84-0	MSD Di-n-octylphthalate	110	0.00 U	90.3	82	37-134	1	0-30
205-99-2	MSD Benzo(b)fluoranthene	110	0.00 U	94.4	86	31-122	5	0-30
207-08-9	MSD Benzo(k)fluoranthene	110	0.00 U	94.7	86	33-123	1	0-30
50-32-8	MSD Benzo(a)pyrene	110	0.00 U	90.2	82	32-118	3	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

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SDG Number: 2017-1975

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-141872MSD

Matrix: W

Lab Sample ID 1203832696

Instrument: MSD5.I

Analysis Date: 07/19/2017 21:12

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1683030

Inj. Vol: 1 uL

Batch ID: 1683031

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	110	0.00	U	87.8	80	27-121	1 0-30
53-70-3	MSD Dibenzo(a,h)anthracene	110	0.00	U	89.2	81	30-125	0 0-30
191-24-2	MSD Benzo(ghi)perylene	110	0.00	U	87.2	79	24-126	1 0-30
123-91-1	MSD 1,4-Dioxane	110	0.00	U	54.7	50	24-110	14 0-30
930-55-2	MSD N-Nitrosopyrrolidine	110	0.00	U	93.1	85	47-119	5 0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	110	0.00	U	63.7	58	32-101	0 0-30
1912-24-9	MSD Atrazine	110	0.00	U	87.6	80	42-129	2 0-30
92-87-5	MSD Benzidine	220	0.00	U	113	51	15-130	13 0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	110	0.00	U	95.2	87	34-124	1 0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	110	0.00	U	58.4	53	26-102	1 0-30

## Method Blank Summary

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SDG Number:	2017-1975	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1683030	Instrument ID:	MSD5.I	Data File:	s071917.B\s5g1910.D
Lab Sample ID:	1203832693	Prep Date:	07/19/2017 06:45	Analyzed:	07/19/17 17:43
Column:	DB-5ms				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1683030	1203832694	s071917.B\s5g1911.D	07/19/17	1813
02 CAWA-17-141872MS	1203832695	s071917.B\s5g1916.D	07/19/17	2042
03 CAWA-17-141872MSD	1203832696	s071917.B\s5g1917.D	07/19/17	2112
04 CAPA-17-141868	428121003	s071917.B\s5g1922.D	07/19/17	2341

# Quality Control Data



**Semi-Volatile  
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SDG Number: 2017-1975

Lab Sample ID: 1203832693

Client Sample: QC for batch 1683030

Client ID: MB for batch 1683030

Batch ID: 1683031

Run Date: 07/19/2017 17:43

Prep Date: 07/19/2017 06:45

Data File: s071917.B\s5g1910.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD5.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
85-68-7	Butylbenzylphthalate	U	10.0	ug/L	3.00	10.0
84-74-2	Di-n-butylphthalate	U	10.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	10.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	10.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	10.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.0	ug/L	3.00	10.0
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	10.0	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
122-66-7	Azobenzene	U	10.0	ug/L	3.00	10.0
541-73-1	<i>1,2-Diphenylhydrazine</i> 1,3-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	10.0	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	10.0	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	10.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	10.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	10.0	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	20.0	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	1.00	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	10.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.0	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	10.0	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	10.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	10.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	10.0	ug/L	3.00	10.0
106-47-8	<i>4-Chloro-3-methylphenol</i> 4-Chloroaniline	U	10.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	10.0	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	10.0	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	1.00	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	1.00	ug/L	0.300	1.00
62-53-3	Aniline	U	10.0	ug/L	4.20	10.0

**Semi-Volatile  
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<b>SDG Number:</b> 2017-1975		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203832693			
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> MB for batch 1683030	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b>	GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b>	1
<b>Run Date:</b> 07/19/2017 17:43	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b>	1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 1000 mL	<b>Final Volume:</b>	1 mL
<b>Data File:</b> s071917.B\s5g1910.D	<b>Column:</b> DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
120-12-7	Anthracene	U	1.00	ug/L	0.300	1.00
1912-24-9	Atrazine	U	10.0	ug/L	3.00	10.0
92-87-5	Benzidine	U	10.0	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene	U	1.00	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	1.00	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	1.00	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	1.00	ug/L	0.300	1.00
207-08-9	Benzo(k)fluoranthene	U	1.00	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	20.0	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	10.0	ug/L	3.00	10.0
218-01-9	Chrysene	U	1.00	ug/L	0.300	1.00
53-70-3	Dibenzo(a,h)anthracene	U	1.00	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	10.0	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	10.0	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	1.00	ug/L	0.300	1.00
86-73-7	Fluorene	U	1.00	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	10.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	10.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	10.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	10.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.00	ug/L	0.300	1.00
78-59-1	Isophorone	U	10.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine	U	10.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.0	ug/L	3.00	10.0
98-95-3	Nitrobenzene	U	10.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	10.0	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	1.00	ug/L	0.300	1.00
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
129-00-0	Pyrene	U	1.00	ug/L	0.300	1.00
110-86-1	Pyridine	U	10.0	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	10.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	10.0	ug/L	3.00	10.0

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<b>SDG Number:</b> 2017-1975	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203832693	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004
<b>Client ID:</b> MB for batch 1683030	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I
<b>Run Date:</b> 07/19/2017 17:43	<b>Analyst:</b> JLD1
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s071917.B\s5g1910.D	<b>Column:</b> DB-5ms
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-009
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 1 uL
	<b>Final Volume:</b> 1 mL

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	65.6	100	ug/L	66	(32%-124%)
2-Fluorobiphenyl	36.3	50.0	ug/L	73	(32%-112%)
2-Fluorophenol	41.3	100	ug/L	41	(15%-88%)
Nitrobenzene-d5	39.6	50.0	ug/L	79	(36%-115%)
Phenol-d5	28.2	100	ug/L	28	(15%-91%)
p-Terphenyl-d14	40.0	50.0	ug/L	80	(36%-121%)

**Tentatively Identified Compound Summary**

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

**Semi-Volatile  
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SDG Number: 2017-1975

Lab Sample ID: 1203832694

Client Sample: QC for batch 1683030

Client ID: LCS for batch 1683030

Batch ID: 1683031

Run Date: 07/19/2017 18:13

Prep Date: 07/19/2017 06:45

Data File: s071917.B\s5g1911.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD5.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
91-20-3	Naphthalene		38.8	ug/L	0.300	1.00
85-68-7	Butylbenzylphthalate		37.8	ug/L	3.00	10.0
84-74-2	Di-n-butylphthalate		40.4	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		35.2	ug/L	3.00	10.0
84-66-2	Diethylphthalate		43.7	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		43.2	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		37.1	ug/L	3.00	10.0
95-94-3	1,2,4,5-Tetrachlorobenzene		38.7	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		35.8	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		34.9	ug/L	3.00	10.0
122-66-7	Azobenzene		42.5	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		33.4	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		34.1	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		27.2	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		38.5	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		42.9	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		44.9	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		41.8	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		41.9	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		37.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		33.2	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		47.1	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		45.9	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		37.4	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		37.7	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		37.7	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		37.9	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		40.2	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		45.7	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		39.4	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		42.2	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		51.7	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		43.3	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		10.9	ug/L	3.00	10.0
83-32-9	Acenaphthene		43.8	ug/L	0.300	1.00
208-96-8	Acenaphthylene		42.2	ug/L	0.300	1.00
62-53-3	Aniline		38.4	ug/L	4.20	10.0

**Semi-Volatile  
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Sample Summary**

SDG Number: 2017-1975

Lab Sample ID: 1203832694

Client Sample: QC for batch 1683030

Client ID: LCS for batch 1683030

Batch ID: 1683031

Run Date: 07/19/2017 18:13

Prep Date: 07/19/2017 06:45

Data File: s071917.B\s5g1911.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD5.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
120-12-7	Anthracene		41.1	ug/L	0.300	1.00
1912-24-9	Atrazine		47.0	ug/L	3.00	10.0
92-87-5	Benzidine		78.7	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		41.7	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		41.1	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		41.1	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		42.6	ug/L	0.300	1.00
207-08-9	Benzo(k)fluoranthene		42.0	ug/L	0.300	1.00
65-85-0	Benzoic acid		30.8	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		35.1	ug/L	3.00	10.0
218-01-9	Chrysene		42.1	ug/L	0.300	1.00
53-70-3	Dibenzo(a,h)anthracene		43.4	ug/L	0.300	1.00
132-64-9	Dibenzofuran		42.1	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		39.0	ug/L	3.00	10.0
206-44-0	Fluoranthene		43.6	ug/L	0.300	1.00
86-73-7	Fluorene		42.5	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		37.9	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		33.2	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		30.6	ug/L	3.00	10.0
67-72-1	Hexachloroethane		34.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		43.2	ug/L	0.300	1.00
78-59-1	Isophorone		47.1	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		24.7	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		44.2	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		43.5	ug/L	3.00	10.0
98-95-3	Nitrobenzene		47.2	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		42.5	ug/L	3.00	10.0
85-01-8	Phenanthrene		41.0	ug/L	0.300	1.00
108-95-2	Phenol		16.7	ug/L	3.00	10.0
129-00-0	Pyrene		37.7	ug/L	0.300	1.00
110-86-1	Pyridine		24.5	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		45.5	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		45.5	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		44.4	ug/L	3.00	10.0

**Semi-Volatile  
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Sample Summary**

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<b>SDG Number:</b> 2017-1975	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203832694	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1683030	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I
<b>Run Date:</b> 07/19/2017 18:13	<b>Analyst:</b> JLD1
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s071917.B\s5g1911.D	<b>Column:</b> DB-5ms
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-009
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 1 uL
	<b>Final Volume:</b> 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		35.5	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		55.1	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		37.1	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		49.6	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		47.3	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	85.9	100	ug/L	86	(32%-124%)
2-Fluorobiphenyl	40.6	50.0	ug/L	81	(32%-112%)
2-Fluorophenol	48.2	100	ug/L	48	(15%-88%)
Nitrobenzene-d5	47.0	50.0	ug/L	94	(36%-115%)
Phenol-d5	31.9	100	ug/L	32	(15%-91%)
p-Terphenyl-d14	41.9	50.0	ug/L	84	(36%-121%)

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832695	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 20:42	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1916.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		63.6	ug/L	6.59	22.0
120-82-1	1,2,4-Trichlorobenzene		58.8	ug/L	6.59	22.0
95-50-1	1,2-Dichlorobenzene		57.2	ug/L	6.59	22.0
122-66-7	Azobenzene		80.8	ug/L	6.59	22.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		55.1	ug/L	6.59	22.0
106-46-7	1,4-Dichlorobenzene		55.2	ug/L	6.59	22.0
123-91-1	1,4-Dioxane		62.7	ug/L	6.59	22.0
90-12-0	1-Methylnaphthalene		65.9	ug/L	0.659	2.20
58-90-2	2,3,4,6-Tetrachlorophenol		66.8	ug/L	6.59	22.0
95-95-4	2,4,5-Trichlorophenol		70.5	ug/L	6.59	22.0
88-06-2	2,4,6-Trichlorophenol		65.4	ug/L	6.59	22.0
120-83-2	2,4-Dichlorophenol		62.0	ug/L	6.59	22.0
105-67-9	2,4-Dimethylphenol		58.9	ug/L	6.59	22.0
51-28-5	2,4-Dinitrophenol		48.2	ug/L	11.0	44.0
121-14-2	2,4-Dinitrotoluene		101	ug/L	6.59	22.0
606-20-2	2,6-Dinitrotoluene		96.6	ug/L	6.59	22.0
91-58-7	2-Chloronaphthalene		63.0	ug/L	0.901	2.20
95-57-8	2-Chlorophenol		55.7	ug/L	6.59	22.0
534-52-1	2-Methyl-4,6-dinitrophenol		54.1	ug/L	6.59	22.0
91-57-6	2-Methylnaphthalene		65.5	ug/L	0.659	2.20
88-75-5	2-Nitrophenol		60.7	ug/L	6.59	22.0
91-94-1	3,3'-Dichlorobenzidine		94.0	ug/L	6.59	22.0
101-55-3	4-Bromophenylphenylether		69.7	ug/L	6.59	22.0
59-50-7	Parachlorometa cresol		68.9	ug/L	6.59	22.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		110	ug/L	7.25	22.0
7005-72-3	4-Chlorophenylphenylether		75.9	ug/L	6.59	22.0
100-02-7	4-Nitrophenol	J	21.9	ug/L	6.59	22.0
83-32-9	Acenaphthene		77.5	ug/L	0.659	2.20
208-96-8	Acenaphthylene		78.6	ug/L	0.659	2.20
62-53-3	Aniline		89.5	ug/L	9.23	22.0
120-12-7	Anthracene		80.2	ug/L	0.659	2.20
1912-24-9	Atrazine		85.6	ug/L	6.59	22.0
92-87-5	Benzidine		98.9	ug/L	8.57	22.0
56-55-3	Benzo(a)anthracene		89.1	ug/L	0.659	2.20
50-32-8	Benzo(a)pyrene		87.4	ug/L	0.659	2.20
205-99-2	Benzo(b)fluoranthene		90.2	ug/L	0.659	2.20
191-24-2	Benzo(ghi)perylene		87.7	ug/L	0.659	2.20

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832695	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 20:42	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1916.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		93.4	ug/L	0.659	2.20
65-85-0	Benzoic acid		58.1	ug/L	13.2	44.0
100-51-6	Benzyl alcohol		81.5	ug/L	6.59	22.0
85-68-7	Butylbenzylphthalate		88.2	ug/L	6.59	22.0
218-01-9	Chrysene		87.8	ug/L	0.659	2.20
84-74-2	Di-n-butylphthalate		86.5	ug/L	6.59	22.0
117-84-0	Di-n-octylphthalate		89.5	ug/L	6.59	22.0
53-70-3	Dibenzo(a,h)anthracene		88.9	ug/L	0.659	2.20
132-64-9	Dibenzofuran		76.9	ug/L	6.59	22.0
84-66-2	Diethylphthalate		93.1	ug/L	6.59	22.0
131-11-3	Dimethylphthalate		92.9	ug/L	6.59	22.0
88-85-7	Dinoseb	U	22.0	ug/L	6.59	22.0
122-39-4	Diphenylamine		79.2	ug/L	6.59	22.0
206-44-0	Fluoranthene		91.5	ug/L	0.659	2.20
86-73-7	Fluorene		80.4	ug/L	0.659	2.20
118-74-1	Hexachlorobenzene		70.9	ug/L	6.59	22.0
87-68-3	Hexachlorobutadiene		54.0	ug/L	6.59	22.0
77-47-4	Hexachlorocyclopentadiene		25.4	ug/L	6.59	22.0
67-72-1	Hexachloroethane		56.2	ug/L	6.59	22.0
193-39-5	Indeno(1,2,3-cd)pyrene		87.1	ug/L	0.659	2.20
78-59-1	Isophorone		98.7	ug/L	7.69	22.0
62-75-9	N-Methyl-N-nitrosomethylamine		59.5	ug/L	6.59	22.0
924-16-3	N-Nitrosodi-n-butylamine	U	22.0	ug/L	6.59	22.0
55-18-5	N-Nitrosodiethylamine	U	22.0	ug/L	6.59	22.0
621-64-7	N-Nitrosodi--n-propylamine		97.8	ug/L	6.59	22.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		97.8	ug/L	6.59	22.0
91-20-3	Naphthalene		66.9	ug/L	0.659	2.20
98-95-3	Nitrobenzene		93.9	ug/L	6.59	22.0
608-93-5	Pentachlorobenzene	U	22.0	ug/L	6.59	22.0
87-86-5	Pentachlorophenol		61.4	ug/L	6.59	22.0
85-01-8	Phenanthrene		79.2	ug/L	0.659	2.20
108-95-2	Phenol		30.2	ug/L	6.59	22.0
129-00-0	Pyrene		82.1	ug/L	0.659	2.20
110-86-1	Pyridine		57.1	ug/L	6.59	22.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		92.3	ug/L	6.59	22.0
111-91-1	bis(2-Chloroethoxy)methane		93.5	ug/L	6.59	22.0
111-44-4	bis(2-Chloroethyl) ether		91.4	ug/L	6.59	22.0
117-81-7	bis(2-Ethylhexyl)phthalate		89.0	ug/L	6.59	22.0



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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832695	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 20:42	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1916.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		57.3	ug/L	8.13	22.0
99-09-2	3-Nitroaniline		114	ug/L	6.59	22.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		56.7	ug/L	6.59	22.0
88-74-4	2-Nitroaniline		106	ug/L	6.59	22.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		95.5	ug/L	6.59	22.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	137	220	ug/L	62	(32%-124%)
2-Fluorobiphenyl	72.9	110	ug/L	66	(32%-112%)
2-Fluorophenol	78.8	220	ug/L	36	(15%-88%)
Nitrobenzene-d5	91.8	110	ug/L	84	(36%-115%)
Phenol-d5	58.3	220	ug/L	27	(15%-91%)
p-Terphenyl-d14	89.0	110	ug/L	81	(36%-121%)

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832696	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 21:12	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1917.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		63.7	ug/L	6.59	22.0
120-82-1	1,2,4-Trichlorobenzene		58.4	ug/L	6.59	22.0
95-50-1	1,2-Dichlorobenzene		56.0	ug/L	6.59	22.0
122-66-7	Azobenzene		83.1	ug/L	6.59	22.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		52.7	ug/L	6.59	22.0
106-46-7	1,4-Dichlorobenzene		52.3	ug/L	6.59	22.0
123-91-1	1,4-Dioxane		54.7	ug/L	6.59	22.0
90-12-0	1-Methylnaphthalene		67.2	ug/L	0.659	2.20
58-90-2	2,3,4,6-Tetrachlorophenol		66.5	ug/L	6.59	22.0
95-95-4	2,4,5-Trichlorophenol		71.2	ug/L	6.59	22.0
88-06-2	2,4,6-Trichlorophenol		65.1	ug/L	6.59	22.0
120-83-2	2,4-Dichlorophenol		63.7	ug/L	6.59	22.0
105-67-9	2,4-Dimethylphenol		58.5	ug/L	6.59	22.0
51-28-5	2,4-Dinitrophenol	J	41.5	ug/L	11.0	44.0
121-14-2	2,4-Dinitrotoluene		95.6	ug/L	6.59	22.0
606-20-2	2,6-Dinitrotoluene		96.9	ug/L	6.59	22.0
91-58-7	2-Chloronaphthalene		62.3	ug/L	0.901	2.20
95-57-8	2-Chlorophenol		54.7	ug/L	6.59	22.0
534-52-1	2-Methyl-4,6-dinitrophenol		55.1	ug/L	6.59	22.0
91-57-6	2-Methylnaphthalene		66.0	ug/L	0.659	2.20
88-75-5	2-Nitrophenol		61.3	ug/L	6.59	22.0
91-94-1	3,3'-Dichlorobenzidine		95.2	ug/L	6.59	22.0
101-55-3	4-Bromophenylphenylether		72.6	ug/L	6.59	22.0
59-50-7	Parachlorometa cresol		67.7	ug/L	6.59	22.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		109	ug/L	7.25	22.0
7005-72-3	4-Chlorophenylphenylether		73.8	ug/L	6.59	22.0
100-02-7	4-Nitrophenol	J	19.8	ug/L	6.59	22.0
83-32-9	Acenaphthene		77.1	ug/L	0.659	2.20
208-96-8	Acenaphthylene		78.1	ug/L	0.659	2.20
62-53-3	Aniline		84.9	ug/L	9.23	22.0
120-12-7	Anthracene		81.8	ug/L	0.659	2.20
1912-24-9	Atrazine		87.6	ug/L	6.59	22.0
92-87-5	Benzidine		113	ug/L	8.57	22.0
56-55-3	Benzo(a)anthracene		92.0	ug/L	0.659	2.20
50-32-8	Benzo(a)pyrene		90.2	ug/L	0.659	2.20
205-99-2	Benzo(b)fluoranthene		94.4	ug/L	0.659	2.20
191-24-2	Benzo(ghi)perylene		87.2	ug/L	0.659	2.20

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

<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832696	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 21:12	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1917.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		94.7	ug/L	0.659	2.20
65-85-0	Benzoic acid		58.1	ug/L	13.2	44.0
100-51-6	Benzyl alcohol		73.1	ug/L	6.59	22.0
85-68-7	Butylbenzylphthalate		93.9	ug/L	6.59	22.0
218-01-9	Chrysene		91.7	ug/L	0.659	2.20
84-74-2	Di-n-butylphthalate		88.4	ug/L	6.59	22.0
117-84-0	Di-n-octylphthalate		90.3	ug/L	6.59	22.0
53-70-3	Dibenzo(a,h)anthracene		89.2	ug/L	0.659	2.20
132-64-9	Dibenzofuran		75.6	ug/L	6.59	22.0
84-66-2	Diethylphthalate		94.3	ug/L	6.59	22.0
131-11-3	Dimethylphthalate		92.0	ug/L	6.59	22.0
88-85-7	Dinoseb	U	22.0	ug/L	6.59	22.0
122-39-4	Diphenylamine		81.5	ug/L	6.59	22.0
206-44-0	Fluoranthene		91.5	ug/L	0.659	2.20
86-73-7	Fluorene		79.3	ug/L	0.659	2.20
118-74-1	Hexachlorobenzene		74.1	ug/L	6.59	22.0
87-68-3	Hexachlorobutadiene		55.1	ug/L	6.59	22.0
77-47-4	Hexachlorocyclopentadiene		24.7	ug/L	6.59	22.0
67-72-1	Hexachloroethane		54.5	ug/L	6.59	22.0
193-39-5	Indeno(1,2,3-cd)pyrene		87.8	ug/L	0.659	2.20
78-59-1	Isophorone		99.7	ug/L	7.69	22.0
62-75-9	N-Methyl-N-nitrosomethylamine		53.7	ug/L	6.59	22.0
924-16-3	N-Nitrosodi-n-butylamine	U	22.0	ug/L	6.59	22.0
55-18-5	N-Nitrosodiethylamine	U	22.0	ug/L	6.59	22.0
621-64-7	N-Nitrosodi--n-propylamine		94.0	ug/L	6.59	22.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		93.1	ug/L	6.59	22.0
91-20-3	Naphthalene		66.8	ug/L	0.659	2.20
98-95-3	Nitrobenzene		94.1	ug/L	6.59	22.0
608-93-5	Pentachlorobenzene	U	22.0	ug/L	6.59	22.0
87-86-5	Pentachlorophenol		60.5	ug/L	6.59	22.0
85-01-8	Phenanthrene		80.6	ug/L	0.659	2.20
108-95-2	Phenol		26.4	ug/L	6.59	22.0
129-00-0	Pyrene		88.0	ug/L	0.659	2.20
110-86-1	Pyridine		56.4	ug/L	6.59	22.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		90.6	ug/L	6.59	22.0
111-91-1	bis(2-Chloroethoxy)methane		95.5	ug/L	6.59	22.0
111-44-4	bis(2-Chloroethyl) ether		88.4	ug/L	6.59	22.0
117-81-7	bis(2-Ethylhexyl)phthalate		93.9	ug/L	6.59	22.0

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

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<b>SDG Number:</b> 2017-1975	<b>Date Collected:</b> 07/13/2017 07:45	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203832696	<b>Date Received:</b> 07/15/2017 09:00	
<b>Client Sample:</b> QC for batch 1683030	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-141872MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1683031	<b>Inst:</b> MSD5.I	<b>Dilution:</b> 1
<b>Run Date:</b> 07/19/2017 21:12	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 07/19/2017 06:45	<b>Aliquot:</b> 455 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s071917.B\s5g1917.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		53.5	ug/L	8.13	22.0
99-09-2	3-Nitroaniline		111	ug/L	6.59	22.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		54.8	ug/L	6.59	22.0
88-74-4	2-Nitroaniline		101	ug/L	6.59	22.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		93.5	ug/L	6.59	22.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	131	220	ug/L	60	(32%-124%)
2-Fluorobiphenyl	73.8	110	ug/L	67	(32%-112%)
2-Fluorophenol	66.7	220	ug/L	30	(15%-88%)
Nitrobenzene-d5	92.1	110	ug/L	84	(36%-115%)
Phenol-d5	51.8	220	ug/L	24	(15%-91%)
p-Terphenyl-d14	93.0	110	ug/L	85	(36%-121%)

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1975  
Work Order #: 428121**

**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:                    1683852

Prep Batch Number:                    1683851

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
428121003	428121003 (CAPA-17-141868)
1203834825	Interference Check Sample (ICS)
1203834821	Method Blank (MB)
1203834822	Laboratory Control Sample (LCS)
1203834823	427997002(CAWA-17-141859) Matrix Spike (MS)
1203834824	427997002(CAWA-17-141859) 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 427997002 (CAWA-17-141859) was chosen for matrix spike and matrix spike duplicate analysis.

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

The MS recoveries were within the established acceptance limits.

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

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

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

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

##### **Retention Time**

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

#### **Technical Information**

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

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



**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

**Miscellaneous Information****Manual Integrations**

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

**Method Comments**

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

**Additional Comments**

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

**Perchlorate Isotope Ratio**

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

**System Configuration**

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

**Electronic Packaging Comment**

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

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

**Chromatographic Columns**

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

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

Dionex: IonPac AG-16 2 x 50 mm.

**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1975 GEL Work Order: 428121

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

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

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 27 JUL 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: 1683851Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-141868Date Received: 18-JUL-17GEL Job No (SDG): 2017-1975GEL Sample ID: 428121003Date Filtered: 20-JUL-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	24-JUL-17 23:25	per0724027a
	Perchlorate Isotope Ratio						1	24-JUL-17 23:25	per0724027a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	24-JUL-17 23:25	per0724027a
	Perchlorate-O(18)			0.421	ug/L		1	24-JUL-17 23:25	per0724027a

^ 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):** 2017-1975

**Extract Batch Code:** 1683851

**Date Filtered:** 20-JUL-17

**Matrix:** WATER

**Sample ID:** 1203834822

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.205	ug/L	102		85 - 115
Perchlorate Isotope Ratio		2.73				-
Perchlorate-101	0.200	.218	ug/L	109		85 - 115
Perchlorate-O(18)		.453	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):** 2017-1975

**Extract Batch Code:** 1683851

**Date Extracted:** 20-JUL-17

**GEL MS/PS ID:** 1203834823

**Client ID:** CAWA-17-141859

**GEL MSD/PSD ID:** 1203834824

**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	0.268	ug/L	0.474	103	.453	93	4	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		2.82		2.96		5		-
Perchlorate-101	0.200	0.259	ug/L	0.488	114	.444	92	10	30	75 - 125
Perchlorate-O(18)	0	0.459	ug/L	0.443		.456		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 LLC

Client Sample No.

MBLab Code: GELDate Received: 20-JUL-17Instrument: LCMSMSGEL Job No (SDG): 2017-1975Method: EPA 6850 ModifiedGEL Sample ID: 1203834821Matrix: WATERDate Filtered: 20-JUL-17Extraction Batch ID: 1683851Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL%Solids:     Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	24-JUL-17 19:56	per0724013a
	Perchlorate Isotope Ratio						1	24-JUL-17 19:56	per0724013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	24-JUL-17 19:56	per0724013a
	Perchlorate-O(18)			0.490	ug/L		1	24-JUL-17 19:56	per0724013a

^ 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: 1683851Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 20-JUL-17GEL Job No (SDG): 2017-1975GEL Sample ID: 1203834822Date Filtered: 20-JUL-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	0.205	ug/L		1	24-JUL-17 20:11	per0724014a
	Perchlorate Isotope Ratio			2.73			1	24-JUL-17 20:11	per0724014a
14797-73-0	Perchlorate-101	.05	.2	0.218	ug/L		1	24-JUL-17 20:11	per0724014a
	Perchlorate-O(18)			0.453	ug/L		1	24-JUL-17 20:11	per0724014a

^ 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: 1683851Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1975GEL Sample ID: 1203834825Date Filtered: 20-JUL-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	0.216	ug/L		1	24-JUL-17 20:26	per0724015a
	Perchlorate Isotope Ratio			2.85			1	24-JUL-17 20:26	per0724015a
14797-73-0	Perchlorate-101	.05	.2	0.220	ug/L		1	24-JUL-17 20:26	per0724015a
	Perchlorate-O(18)			0.454	ug/L		1	24-JUL-17 20:26	per0724015a

^ 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: 1683851Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-141859MSDate Received: 15-JUL-17GEL Job No (SDG): 2017-1975GEL Sample ID: 1203834823Date Filtered: 20-JUL-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	0.474	ug/L		1	24-JUL-17 21:11	per0724018a
	Perchlorate Isotope Ratio			2.82			1	24-JUL-17 21:11	per0724018a
14797-73-0	Perchlorate-101	.05	.2	0.488	ug/L		1	24-JUL-17 21:11	per0724018a
	Perchlorate-O(18)			0.443	ug/L		1	24-JUL-17 21:11	per0724018a

^ 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: 1683851Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-141859MSDDate Received: 15-JUL-17GEL Job No (SDG): 2017-1975GEL Sample ID: 1203834824Date Filtered: 20-JUL-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	0.453	ug/L		1	24-JUL-17 21:26	per0724019a
	Perchlorate Isotope Ratio			2.96			1	24-JUL-17 21:26	per0724019a
14797-73-0	Perchlorate-101	.05	.2	0.444	ug/L		1	24-JUL-17 21:26	per0724019a
	Perchlorate-O(18)			0.456	ug/L		1	24-JUL-17 21:26	per0724019a

^ 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 #: 2017-1975  
Work Order #: 428121**

**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:                      1683817

Prep Batch Number:        1683816

**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>
428121004	CAPA-17-141868
1203834747	Method Blank (MB)
1203834748	Laboratory Control Sample (LCS)
1203834749	Laboratory Control Sample Duplicate (LCSD)

**Preparation/Analytical Method Verification**

**SOP Reference**

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

**Calibration Information**

**Initial Calibration**

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

**Calibration Verification Standard Requirements**

All continuing calibration verification standards (CCV) have not met requirements of 80-120% for in this SDG. Please refer to Form 7 of the data package for a list of recoveries. A LLOQ level standard was analyzed following the biased low CCV with all target analytes meeting acceptance limits. Since the target analyte was not detected in the associated samples, the data are reported.

**Calibration Blank Requirements**

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

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

#### **CRI Requirements**

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

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

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

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

##### **Surrogate Recoveries**

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

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

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

Sample	Analyte	Value
1203834749 (LCSD)	o-Nitrotoluene	124* (64%-115%)

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

The RPD(s) between the LCS and LCSD met the acceptance limits.

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

A matrix spike and matrix spike duplicate were not performed with this SDG in this batch.

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

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

#### **Technical Information**

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

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

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

All procedures were performed as stated in the SOP.

##### **Sample Dilutions**

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

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

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

## **Miscellaneous Information**

### **Manual Integrations**

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

### **Additional Comments**

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

### **System Configuration**

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

### **Electronic Packaging Comment**

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

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

### **Chromatographic Columns**

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

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

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

### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1975 GEL Work Order: 428121

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

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

#### Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 03 AUG 2017

Title: Group Leader

# **Sample Data Summary**

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-141868

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 428121004

Sample Amount 930 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0724096.wiff

Date Analyzed: 26-JUL-17 22:51

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>				
121-82-4	RDX	.269	U	0.086	0.269
<i>121-82-4</i>	<i>RDX</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>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-141868

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 428121004

Sample Amount 930 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.269	U	0.086	0.269
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.269	U	0.086	0.269
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.538	U	0.086	0.538
479-45-8	Tetryl				
78-11-5	PETN	.538	U	0.108	0.538
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.538	U	0.161	0.538
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1.08	U	0.323	1.08
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.08	U	0.323	1.08
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.08	U	0.323	1.08
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.69	U	0.538	2.69
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.69	U	0.538	2.69
6629-29-4	2,4-Diamino-6-nitrotoluene				

# **Quality Control Summary**



**High Explosives Surrogate Recovery Summary****Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1975**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
428121004	CAPA-17-141868	104	55 - 115	
1203834747	MB for batch 1683816	97	55 - 115	
1203834748	LCS for batch 1683816	96	55 - 115	
1203834749	LCSD for batch 1683816	94	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)** 2017-1975

**Extract Batch Code:** 1683816

**Date Extracted:** 20-JUL-17

**GEL LCS ID:** 1203834748

**GEL LCSDUP ID:** 1203834749

**Analysis Date/Time:** 26-JUL-17 21:42

**DUP Analysis Date/Time:** 26-JUL-17 22:16

**Reporting Units:** ug/L

**QC Type:** LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
HMX	5	4.47	89	4.79	96	7	30	58 - 113
MNX	.5	.497	99	.486	97	2	30	66 - 114
Nitrobenzene	5	4.67	93	4.83	97	4	30	64 - 115
PETN	5	5.48	110	5.66	113	3	30	57 - 126
RDX	5	4.73	95	4.91	98	4	30	64 - 117
TATB	2.5	1.97	79	1.77	71	11	30	47 - 135
TNX	.5	.437	87	.487	97	11	30	51 - 110
Tetryl	5	4.13	83	3.84	77	7	30	55 - 122
m-Dinitrobenzene	5	5	100	5.09	102	2	30	74 - 117
m-Nitrotoluene	5	4.65	93	4.96	99	6	30	66 - 114
o-Nitrotoluene	5	5.36	107	6.21	124 *	15	30	64 - 115
p-Nitrotoluene	5	5.21	104	5.48	110	5	30	66 - 127
tris(o-cresyl) phosphate	5	3.62	72	3.94	79	9	30	43 - 104
1,3,5-Trinitrobenzene	5	4.68	94	4.85	97	3	30	70 - 110
2,4,6-Trinitrotoluene	5	4.95	99	5.18	104	5	30	69 - 113
2,4-Diamino-6-nitrotoluene	5	4.52	90	4.38	88	3	30	50 - 121
2,4-Dinitrotoluene	5	4.61	92	5	100	8	30	71 - 110
2,6-Diamino-4-nitrotoluene	5	4.77	95	4.65	93	3	30	53 - 127
2,6-Dinitrotoluene	5	4.64	93	4.74	95	2	30	72 - 105
2-Amino-4,6-dinitrotoluene	5	4.72	94	5.15	103	9	30	70 - 112
3,5-Dinitroaniline	5	5.06	101	5.21	104	3	30	70 - 121
4-Amino-2,6-dinitrotoluene	5	4.48	90	4.78	96	7	30	74 - 116
DNX	.5	.527	105	.484	97	9	30	65 - 113

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

\* Values outside of QC limits

# Quality Control Data

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834747

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0724093.wiff

Date Analyzed: 26-JUL-17 21:08

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 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834747

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	.25	U	0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.25	U	0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.5	U	0.080	0.500
479-45-8	Tetryl				
78-11-5	PETN	.5	U	0.100	0.500
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.5	U	0.150	0.500
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	1	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.5	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.5	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834748

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0724094.wiff

Date Analyzed: 26-JUL-17 21:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.437		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.497		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.527		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.97		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.62		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	4.13		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
2691-41-0	HMX	4.47		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.48		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.52		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.61		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.64		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.65		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.67		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834748

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	4.68		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.72		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-82-4	RDX	4.73		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.77		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.95		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
618-87-1	3,5-Dinitroaniline	5.06		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
99-99-0	p-Nitrotoluene	5.21		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	5.36		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	5.48		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				

1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCSD for batch 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834749

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0724095.wiff

Date Analyzed: 26-JUL-17 22:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.484		0.080	0.250
80251-29-2	DNX				
5755-27-1	MNX	.486		0.080	0.250
5755-27-1	MNX				
13980-04-6	TNX	.487		0.080	0.250
13980-04-6	TNX				
3058-38-6	TATB	1.77		0.300	1.00
3058-38-6	TATB				
479-45-8	Tetryl	3.84		0.080	0.500
479-45-8	Tetryl				
78-30-8	tris(o-cresyl) phosphate	3.94		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.38		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.65		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.74		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.78		0.080	0.250
19406-51-0	4-Amino-2,6-dinitrotoluene				
2691-41-0	HMX	4.79		0.080	0.250
2691-41-0	HMX				
98-95-3	Nitrobenzene	4.83		0.080	0.250
98-95-3	Nitrobenzene				
99-35-4	1,3,5-Trinitrobenzene	4.85		0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				



1  
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCSD for batch 1683816

Lab Code: GEL

GEL Job No (SDG) 2017-1975

Matrix: WATER

GEL Sample ID: 1203834749

Sample Amount 1000 mL

Date Received: 18-JUL-17

Moisture: .

Extraction Batch ID: 1683816

Extraction Type Sol Exchange

Date Extracted: 20-JUL-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	4.91		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
99-08-1	m-Nitrotoluene	4.96		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.09		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.15		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.18		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.21		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
99-99-0	p-Nitrotoluene	5.48		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
78-11-5	PETN	5.66		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	6.21		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				

## Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1975Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 24-JUL-17 16:47GEL Data File: EXP0724001.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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): 2017-1975Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 24-JUL-17 17:21GEL Data File: EXP0724002.wiffInstrument ID: LCMSMS7Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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
Picric acid	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

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK02

**Analysis Date:** 24-JUL-17 21:55

**GEL Data File:** EXP0724010.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	2.89
tris(o-cresyl) phosphate	0	7.59
TATB	0	0
3,5-Dinitroaniline	0	3.61
2,4-Diamino-6-nitrotoluene	0	5.93
2,6-Diamino-4-nitrotoluene	0	2.65
DNX	0	3.08
MNX	0	2.86
TNX	0	2.53
1,3,5-Trinitrobenzene	0	2.73
2,4,6-Trinitrotoluene	0	3.55
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	3.82
4-Amino-2,6-dinitrotoluene	0	3.23
HMX	0	2.41
Nitrobenzene	0	0
Nitroglycerin	0	8.4
PETN	0	3.47
Picric acid	0	23.18
RDX	0	4.63
Tetryl	0	0
m-Dinitrobenzene	0	2.64
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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 25-JUL-17 00:11

GEL Data File: EXP0724014.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,6-Diamino-4-nitrotoluene	0	2.85
DNX	0	3.47
MNX	0	2.91
TNX	0	2.52
1,3,5-Trinitrobenzene	0	2.79
2,4,6-Trinitrotoluene	0	2.61
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	3.3
4-Amino-2,6-dinitrotoluene	0	2.94
HMX	0	2.22
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	3.48
Picric acid	0	23.26
RDX	0	6.68
Tetryl	0	0
m-Dinitrobenzene	0	2.67
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	2.27
tris(o-cresyl) phosphate	0	5.31
TATB	0	2.43
3,5-Dinitroaniline	0	2.85
2,4-Diamino-6-nitrotoluene	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK04

**Analysis Date:** 25-JUL-17 05:18

**GEL Data File:** EXP0724023.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 25-JUL-17 07:01

GEL Data File: EXP0724026.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.43
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
Picric acid	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 25-JUL-17 11:34

GEL Data File: EXP0724034.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitroglycerin	0	0
PETN	0	0
Picric acid	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	5.67
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



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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK07

**Analysis Date:** 25-JUL-17 14:25

**GEL Data File:** EXP0724039.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	0	0
RDX	0	89.87
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):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK08

**Analysis Date:** 25-JUL-17 14:59

**GEL Data File:** EXP0724040.wiff

**Instrument ID:** LCMSMS7

**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
Picric acid	0	0
RDX	0	38.75
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):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK09

**Analysis Date:** 25-JUL-17 15:33

**GEL Data File:** EXP0724041.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	0	0
RDX	0	25.86
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):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK10

**Analysis Date:** 25-JUL-17 16:07

**GEL Data File:** EXP0724042.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	0	0
RDX	0	15.2
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0

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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK11

**Analysis Date:** 25-JUL-17 17:15

**GEL Data File:** EXP0724044.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	8.3
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
Picric acid	0	0
RDX	0	8.64
Tetryl	0	0
m-Dinitrobenzene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 25-JUL-17 19:32

GEL Data File: EXP0724048.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 25-JUL-17 22:57

GEL Data File: EXP0724054.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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	11.52
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):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK17

**Analysis Date:** 26-JUL-17 12:36

**GEL Data File:** EXP0724078.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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	20.28
TATB	0	0



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

**Lab Name:** GEL Laboratories LLC

**GEL Job No(SDG):** 2017-1975

**Lab Code:** GEL

**Lab Sample ID:** XIBLK18

**Analysis Date:** 26-JUL-17 13:44

**GEL Data File:** EXP0724080.wiff

**Instrument ID:** LCMSMS7

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

Compound	True	Found (ug/L)
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	14.24
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	1.36
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
Picric acid	0	0
RDX	0	0
Tetryl	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK19

Analysis Date: 26-JUL-17 18:52

GEL Data File: EXP0724089.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK20

Analysis Date: 26-JUL-17 20:00

GEL Data File: EXP0724091.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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	13.26
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0

4A  
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 26-JUL-17 23:25

GEL Data File: EXP0724097.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
Picric acid	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK15

Analysis Date: 27-JUL-17 02:15

GEL Data File: EXP0724102.wiff

Instrument ID: LCMSMS7

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
Picric acid	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
2,4,6-Trinitrotoluene	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): 2017-1975

Lab Code: GEL

Lab Sample ID: XIBLK16

Analysis Date: 27-JUL-17 03:24

GEL Data File: EXP0724104.wiff

Instrument ID: LCMSMS7

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	11.39
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
Picric acid	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

# Metals Analysis

# Case Narrative



**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1975**  
**Work Order #: 428121**

<b>Sample ID</b>	<b>Client ID</b>
428121003	CAPA-17-141868
1203833401	Method Blank (MB)ICP
1203833402	Laboratory Control Sample (LCS)
1203833405	428121003(CAPA-17-141868L) Serial Dilution (SD)
1203833403	428121003(CAPA-17-141868D) Sample Duplicate (DUP)
1203833404	428121003(CAPA-17-141868S) Matrix Spike (MS)
1203833321	Method Blank (MB)ICP-MS
1203833322	Laboratory Control Sample (LCS)
1203833325	428121003(CAPA-17-141868L) Serial Dilution (SD)
1203833323	428121003(CAPA-17-141868D) Sample Duplicate (DUP)
1203833324	428121003(CAPA-17-141868S) Matrix Spike (MS)
1203833843	Method Blank (MB)CVAA
1203833844	Laboratory Control Sample (LCS)
1203833847	428121003(CAPA-17-141868L) Serial Dilution (SD)
1203833845	428121003(CAPA-17-141868D) Sample Duplicate (DUP)
1203833846	428121003(CAPA-17-141868S) Matrix Spike (MS)

**Sample Analysis**

Sample 428121003 in this SDG was analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1683256, 1683229, 1683429 and 1691311
<b>Prep Batch :</b>	1683255, 1683228 and 1683428
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-013 REV# 29, GL-MA-E-014 REV# 31, 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 - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum.

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

### **Calibration Information**

#### **Instrument Calibration**

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

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

The CRDL standard recoveries for SW846 6020A/6020B met the advisory control limits with the exception of molybdenum. Client sample concentrations were less than the MDL; therefore the data were not adversely affected. 428121003 (CAPA-17-141868)-ICP-MS.

#### **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: 428121003 (CAPA-17-141868)-ICP, ICP-MS and CVAA.

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

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

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

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

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

#### **Serial Dilution % Difference Statement**

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

#### **Technical Information**

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

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

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

All procedures were performed as stated in the SOP.

##### **Sample Dilutions**

The samples in this SDG did not require dilutions.

##### **Preparation Information**

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

#### **Miscellaneous Information**

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

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

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

##### **Additional Comments**

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

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

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

#### **Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1975 GEL Work Order: 428121

#### **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: 14 AUG 2017**

**Title: Data Validator**

# **Sample Data Summary**

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

**SDG No:** 2017-1975**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 428121003**BASIS:** As Received**DATE COLLECTED** 14-JUL-17**CLIENT ID:** CAPA-17-141868**LEVEL:** Low**DATE RECEIVED** 18-JUL-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	07/20/17 11:19	072017W2-6	1683429

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

**SDG No:** 2017-1975**CONTRACT:** ESHL00114**METHOD TYPE:** SW846**SAMPLE ID:** 428121003**BASIS:** As Received**DATE COLLECTED** 14-JUL-17**CLIENT ID:** CAPA-17-141868**LEVEL:** Low**DATE RECEIVED** 18-JUL-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	SKJ	08/07/17 15:41	170807-5	1683229
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-39-3	Barium	5	ug/L	U	1	5	5	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-70-2	Calcium	200	ug/L	U	50	200	200	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7439-95-4	Magnesium	300	ug/L	U	110	300	300	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7439-98-7	Molybdenum	0.50	ug/L	U	0.2	0.5	0.5	1	MS	SKJ	08/04/17 15:53	170804-4	1683229
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-09-7	Potassium	150	ug/L	U	50	150	150	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7631-86-9	Silica	213	ug/L	U	53	213	213	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-23-5	Sodium	173	ug/L	J	100	300	300	1	P	HSC	07/27/17 08:26	072717A-2	1683256
7440-24-6	Strontium	5	ug/L	U	1	5	5	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	SKJ	08/03/17 22:56	170803-3	1683229
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	SKJ	08/04/17 15:53	170804-4	1683229
7440-62-2	Vanadium	5	ug/L	U	1	5	5	1	P	HSC	07/24/17 13:38	072417A-1	1683256
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	07/24/17 13:38	072417A-1	1683256

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

**SDG No:** 2017-1975**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 428121003**BASIS:** As Received**DATE COLLECTED** 14-JUL-17**CLIENT ID:** CAPA-17-141868**LEVEL:** Low**DATE RECEIVED** 18-JUL-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	1.24	mg/L	U	0.453	1.24	1.24	1		TXT1	08/11/17 16:18		1691311

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1683229	1683228	SW846 3005A	50	mL	50	mL	07/18/17	CXW4
1683256	1683255	SW846 3005A	50	mL	50	mL	07/18/17	CXW4
1683429	1683428	EPA 245.1/245.2 Prep	20	mL	20	mL	07/19/17	AXS5

**\*Analytical Methods:**

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



# **Quality Control Summary**

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

SDG NO. 2017-1975

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>
1203833321	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
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
1203833401	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	-3.81	ug/L	+/-10	J	P	3.3	10
1203833843	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. 2017-1975 Client ID: CAPA-17-141868S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 428121003 Spike ID: 1203833324

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	49.4		1	U	50	98.6		MS
Arsenic	ug/L	75-125	52.3		2	U	50	103		MS
Cadmium	ug/L	75-125	50.8		0.3	U	50	102		MS
Chromium	ug/L	75-125	49.8		3	U	50	99.5		MS
Lead	ug/L	75-125	52.6		0.5	U	50	105		MS
Molybdenum	ug/L	75-125	51.1		0.2	U	50	102		MS
Nickel	ug/L	75-125	52		0.6	U	50	104		MS
Selenium	ug/L	75-125	52.8		2	U	50	103		MS
Silver	ug/L	75-125	52.2		0.3	U	50	104		MS
Thallium	ug/L	75-125	49.3		0.6	U	50	98		MS
Uranium	ug/L	75-125	54.4		0.067	U	50	109		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1975 Client ID: CAPA-17-141868S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 428121003 Spike ID: 1203833404

<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	4910		68	U	5000	97.4		P
Barium	ug/L	75-125	474		1	U	500	94.8		P
Beryllium	ug/L	75-125	469		1	U	500	93.7		P
Boron	ug/L	75-125	483		15	U	500	96.2		P
Calcium	ug/L	75-125	4870		50	U	5000	96.4		P
Cobalt	ug/L	75-125	479		1	U	500	95.7		P
Copper	ug/L	75-125	477		3	U	500	95.4		P
Iron	ug/L	75-125	4950		30	U	5000	99.1		P
Magnesium	ug/L	75-125	5110		110	U	5000	102		P
Manganese	ug/L	75-125	473		2	U	500	94.5		P
Potassium	ug/L	75-125	4800		50	U	5000	96		P
Silica	ug/L	75-125	9950		53	U	10700	92.9		P
Sodium	ug/L	75-125	4870		173	J	5000	93.9		P
Strontium	ug/L	75-125	477		1	U	500	95.3		P
Tin	ug/L	75-125	469		2.5	U	500	93.6		P
Vanadium	ug/L	75-125	475		1	U	500	95		P
Zinc	ug/L	75-125	450		3.3	U	500	90		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

**SDG NO.** 2017-1975 **Client ID:** CAPA-17-141868S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 428121003 **Spike ID:** 1203833846

<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	2.24		0.067	U	2	112		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

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

SDG No.: 2017-1975

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-141868D

Matrix: WATER

Level: Low

Sample ID: 428121003

Duplicate ID: 1203833323

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		0.2 U		0.2 U				MS
Nickel	ug/L		0.6 U		0.6 U				MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L		0.067 U		0.067 U				MS

\*Analytical Methods:

MS SW846 3005A/6020A

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

SDG No.: 2017-1975

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-141868D

Matrix: WATER

Level: Low

Sample ID: 428121003

Duplicate ID: 1203833403

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L		1 U		1 U				P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L		50 U		50 U				P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L		110 U		110 U				P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L		50 U		50 U				P
Silica	ug/L		53 U		53 U				P
Sodium	ug/L		173 J		100 U		200		P
Strontium	ug/L		1 U		1 U				P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L		1 U		1 U				P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

**SDG No.:** 2017–1975**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAPA–17–141868D**Matrix:** WATER**Level:** Low**Sample ID:** 428121003**Duplicate ID:** 1203833845**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. 2017-1975

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>
1203833322								
	Antimony	ug/L	50	48.6		97.2	80-120	MS
	Arsenic	ug/L	50	51.2		102	80-120	MS
	Cadmium	ug/L	50	49.6		99.2	80-120	MS
	Chromium	ug/L	50	49.2		98.5	80-120	MS
	Lead	ug/L	50	50.3		101	80-120	MS
	Molybdenum	ug/L	50	49.8		99.7	80-120	MS
	Nickel	ug/L	50	52.1		104	80-120	MS
	Selenium	ug/L	50	52.2		104	80-120	MS
	Silver	ug/L	50	50.6		101	80-120	MS
	Thallium	ug/L	50	46.4		92.8	80-120	MS
	Uranium	ug/L	50	52.3		105	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1975

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>
1203833402								
	Aluminum	ug/L	5000	4920		98.3	80-120	P
	Barium	ug/L	500	470		94.1	80-120	P
	Beryllium	ug/L	500	466		93.1	80-120	P
	Boron	ug/L	500	478		95.7	80-120	P
	Calcium	ug/L	5000	4830		96.7	80-120	P
	Cobalt	ug/L	500	475		95	80-120	P
	Copper	ug/L	500	472		94.4	80-120	P
	Iron	ug/L	5000	4920		98.3	80-120	P
	Magnesium	ug/L	5000	5110		102	80-120	P
	Manganese	ug/L	500	468		93.6	80-120	P
	Potassium	ug/L	5000	4810		96.1	80-120	P
	Silica	ug/L	10700	9850		92	80-120	P
	Sodium	ug/L	5000	5110		102	80-120	P
	Strontium	ug/L	500	475		95.1	80-120	P
	Tin	ug/L	500	468		93.5	80-120	P
	Vanadium	ug/L	500	470		94.1	80-120	P
	Zinc	ug/L	500	448		89.5	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1975

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>
1203833844	Mercury	ug/L	2	2.13		106	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

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## Serial Dilution Sample Summary

**SDG NO.** 2017-1975 **Client ID:** CAPA-17-141868L

**Contract:** ESHL00114

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

**Sample ID:** 428121003 **Serial Dilution ID:** 1203833325

<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	.2	U	1	U				MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.067	U	.335	U				MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

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## Serial Dilution Sample Summary

SDG NO. 2017-1975

Client ID: CAPA-17-141868L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 428121003

Serial Dilution ID: 1203833405

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	1	U	5	U				P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	50	U	250	U				P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	110	U	550	U				P
Manganese	2	U	10	U				P
Potassium	50	U	250	U				P
Silica	53	U	265	U				P
Sodium	173	J	500	U	10.244			P
Strontium	1	U	5	U				P
Tin	2.5	U	12.5	U				P
Vanadium	1	U	5	U				P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2017-1975 **Client ID:** CAPA-17-141868L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 428121003 **Serial Dilution ID:** 1203833847

<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 #: 2017-1975  
Work Order #: 428121**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1682967

**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>
428121003	CAPA-17-141868
1203832494	Method Blank (MB)
1203832495	Laboratory Control Sample (LCS)
1203832497	427997006(CAWA-17-141863) Sample Duplicate (DUP)
1203832499	427997006(CAWA-17-141863) 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 427997006 (CAWA-17-141863) was selected for QC analysis.

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

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

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

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

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

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

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1682987	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1682986	<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>
428121003	CAPA-17-141868
1203832559	Method Blank (MB)
1203832560	Laboratory Control Sample (LCS)
1203833299	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203834020	428213004(NonSDG) Sample Duplicate (DUP)
1203833300	428121003(CAPA-17-141868) Matrix Spike (MS)
1203834022	428213004(NonSDG) Matrix Spike (MS)

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

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 20.

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **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 428121003 (CAPA-17-141868) and 428213004 (NonSDG) were selected for QC analysis.

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

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

Analyte	Sample	Value
Cyanide, Total	1203833300 (CAPA-17-141868MS)	112* (90.0%-110.0%)
	1203834022 (Non SDG 428213004MS)	115* (90.0%-110.0%)

**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**

Sample1203832560 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

**Miscellaneous Information**

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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:** 1683740      **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>
428121003	CAPA-17-141868
1203834562	Method Blank (MB)
1203834563	Laboratory Control Sample (LCS)
1203834564	427997002(CAWA-17-141859) Sample Duplicate (DUP)
1203834565	427997002(CAWA-17-141859) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

The Ion Chromatography analysis was performed on a Dionex ICS-1600 Ion Chromatograph.

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

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

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

### **Y Intercept Rule**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

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

Sample 427997002 (CAWA-17-141859) was selected for QC analysis.

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

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

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

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

#### **Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

### **Miscellaneous Information**

#### **Manual Integrations**

Samples 1203834564 (CAWA-17-141859DUP), 1203834565 (CAWA-17-141859PS) and 428121003 (CAPA-17-141868) were manually integrated to correctly position the baseline as set in the calibration standards.

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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



scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Ammonia Nitrogen  
**Analytical Batch:** 1683435 **Method:** NH3  
**Prep Batch :** 1683433 **Method:** EPA 350.1 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
428121003	CAPA-17-141868
1203833862	Method Blank (MB)
1203833863	Laboratory Control Sample (LCS)
1203833864	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203833988	428213005(NonSDG) Sample Duplicate (DUP)
1203833865	428121003(CAPA-17-141868) Matrix Spike (MS)
1203833989	428213005(NonSDG) 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. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data. 1203833862 (MB).

**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 428121003 (CAPA-17-141868) and 428213005 (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**

Sample1203833863 (LCS) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

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

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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>	1683499	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1683498	<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>
428121003	CAPA-17-141868
1203833990	Method Blank (MB)
1203833991	Laboratory Control Sample (LCS)
1203833992	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203833993	428213005(NonSDG) Sample Duplicate (DUP)
1203833994	428121003(CAPA-17-141868) Matrix Spike (MS)
1203833995	428213005(NonSDG) 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**

Samples 428121003 (CAPA-17-141868) and 428213005 (NonSDG) were selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203833995 (Non SDG 428213005MS)	130* (90%-110%)

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Samples 1203833991 (LCS), 1203833992 (CAPA-17-141868DUP) and 428121003 (CAPA-17-141868) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

### **Miscellaneous Information**

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1683412

**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>
428121003	CAPA-17-141868
1203833813	Method Blank (MB)
1203833814	Laboratory Control Sample (LCS)
1203833815	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203834040	428213005(NonSDG) Sample Duplicate (DUP)
1203833817	428121003(CAPA-17-141868) Post Spike (PS)
1203834041	428213005(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 428121003 (CAPA-17-141868) and 428213005 (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**

**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>	1683501	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1683500	<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>
428121003	CAPA-17-141868
1203833996	Method Blank (MB)
1203833997	Laboratory Control Sample (LCS)
1203833998	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203833999	428213005(NonSDG) Sample Duplicate (DUP)
1203834000	428121003(CAPA-17-141868) Matrix Spike (MS)
1203834001	428213005(NonSDG) 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**

Samples 428121003 (CAPA-17-141868) and 428213005 (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****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:** 1683492

**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>
428121003	CAPA-17-141868
1203833965	Method Blank (MB)
1203833966	Laboratory Control Sample (LCS)
1203833967	427997004(CAWA-17-141861) Sample Duplicate (DUP)
1203833968	428213006(NonSDG) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

**Consecutive Weight Checks**

All consecutive weight checks were met.

**Quality Control (QC) Designation**

Samples 427997004 (CAWA-17-141861) and 428213006 (NonSDG) were selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1683487

**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>
428121003	CAPA-17-141868
1203833954	Laboratory Control Sample (LCS)
1203833955	427997002(CAWA-17-141859) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

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

Sample 427997002 (CAWA-17-141859) was selected for QC analysis.



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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1685419 **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>
428121003	CAPA-17-141868
1203838699	Laboratory Control Sample (LCS)
1203838700	428121003(CAPA-17-141868) 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 428121003 (CAPA-17-141868) 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
1203838700 (CAPA-17-141868DUP)	pH	Received 18-JUL-17, out of holding 14-JUL-17
428121003 (CAPA-17-141868)	pH	Received 18-JUL-17, out of holding 14-JUL-17

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1685418      **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>
428121003	CAPA-17-141868
1203838682	Laboratory Control Sample (LCS)
1203838683	428121003(CAPA-17-141868) Sample Duplicate (DUP)
1203838687	428121003(CAPA-17-141868) 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 428121003 (CAPA-17-141868) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1975 GEL Work Order: 428121

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

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

#### Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 07 AUG 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: August 7, 2017

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

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

Client SDG: 2017-1975

Client Sample ID: CAPA-17-141868  
Sample ID: 428121003  
Matrix: W  
Collect Date: 14-JUL-17 09:15  
Receive Date: 18-JUL-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	07/21/17	1027	1682967	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	07/21/17	1310	1682987	2
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	07/21/17	0214	1683740	3
Chloride	J	0.130	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0606	0.017	0.050	mg/L	1.00	1	KLP1	07/21/17	1256	1683435	4
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	07/19/17	1016	1683412	5
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	07/21/17	1027	1683501	6
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	07/21/17	1647	1683499	7
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids	U	ND	3.40	14.3	mg/L			KLP1	07/20/17	1429	1683492	8
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3	U	ND	1.45	4.00	mg/L			RXB5	07/26/17	1516	1685418	9
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		1.51	1.00	1.00	umhos/cm		1	VH1	07/25/17	1126	1683487	10
PH "As Received"												
pH at Temp 13.6C	H	6.05	0.010	0.100	SU		1	RXB5	07/26/17	1516	1685419	11

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
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# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 7, 2017

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

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

Client SDG: 2017-1975

Client Sample ID: CAPA-17-141868  
Sample ID: 428121003

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
EPA 335.4	EPA 335.4	Total Cyanide		AXH3	07/21/17		1055		1682986			
EPA 350.1 Prep	EPA 350.1	Ammonia Nitrogen Prep		AXH3	07/20/17		1413		1683433			
EPA 351.2 Prep	EPA 351.2	Total Kjeldahl Nitrogen Prep		KLP1	07/20/17		1700		1683498			
EPA 365.4 Prep	EPA 365.4	Phosphorus, Total in liquid PR		KLP1	07/20/17		1700		1683500			

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	SW-846:9060		
2	EPA 335.4 1993		
3	EPA:300.0		
4	EPA:350.1		
5	EPA:353.2		
6	EPA 365.4 1974		
7	EPA:351.2		
8	EPA:160.1		
9	EPA:310.1		
10	EPA:120.1		
11	EPA 150.1 1982		

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	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: August 7, 2017

Page 1 of 7

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

Contact: Ms. Nita Patel

Workorder: 428121

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1682967										
QC1203832497	427997006	DUP									
Total Organic Carbon Average		J	0.495	J	0.467	mg/L	5.82 ^	(+/-1.00)	TSM	07/21/17	01:28
QC1203832495	LCS										
Total Organic Carbon Average	10.0				10.0	mg/L		100 (80%-120%)		07/20/17	18:15
QC1203832494	MB										
Total Organic Carbon Average			U		ND	mg/L				07/20/17	18:03
QC1203832499	427997006	PS									
Total Organic Carbon Average	10.0	J	0.495		11.0	mg/L		105 (75%-125%)		07/21/17	02:15
<b>Flow Injection Analysis</b>											
Batch	1682987										
QC1203833299	428121003	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	07/21/17	13:11
QC1203834020	428213004	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			07/21/17	13:26
QC1203832560	LCS										
Cyanide, Total	50.0				51.2	ug/L		102 (90%-110%)		07/21/17	13:19
QC1203832559	MB										
Cyanide, Total			U		ND	ug/L				07/21/17	13:04
QC1203833300	428121003	MS									
Cyanide, Total	100	U	ND		112	ug/L		112 * (90%-110%)		07/21/17	13:12
QC1203834022	428213004	MS									
Cyanide, Total	100	U	ND		115	ug/L		115 * (90%-110%)		07/21/17	13:27

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1683740										
QC1203834564	427997002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	07/20/17	23:21
Chloride			1.43		1.41	mg/L	1.32	(0%-20%)			
Fluoride		J	0.0496	J	0.0493	mg/L	0.607 ^	(+/-0.100)			
Sulfate			2.99		2.94	mg/L	1.54	(0%-20%)			
QC1203834563	LCS										
Bromide	1.25				1.24	mg/L	98.8	(80%-120%)		07/20/17	22:23
Chloride	5.00				4.73	mg/L	94.7	(80%-120%)			
Fluoride	2.50				2.38	mg/L	95	(80%-120%)			
Sulfate	10.0				9.73	mg/L	97.3	(80%-120%)			
QC1203834562	MB										
Bromide			U		ND	mg/L				07/20/17	21:54
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203834565	427997002	PS									
Bromide	1.25	U	ND		1.35	mg/L	104	(75%-125%)		07/20/17	23:50
Chloride	5.00		1.43		6.45	mg/L	100	(75%-125%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1683740										
Fluoride	2.50	J	0.0496	2.51	mg/L		98.3	(75%-125%)	MXL2	07/20/17	23:50
Sulfate	10.0		2.99	13.4	mg/L		104	(75%-125%)			
<b>Nutrient Analysis</b>											
Batch	1683412										
QC1203833815	428121003	DUP									
Nitrogen, Nitrate/Nitrite		U	ND	U	ND	mg/L	N/A		AXH3	07/19/17	10:17
QC1203834040	428213005	DUP									
Nitrogen, Nitrate/Nitrite			0.177		0.177	mg/L	0 ^	(+/-0.050)		07/19/17	13:32
QC1203833814	LCS										
Nitrogen, Nitrate/Nitrite	1.00				1.01	mg/L		101 (90%-110%)		07/19/17	10:10
QC1203833813	MB										
Nitrogen, Nitrate/Nitrite			U		ND	mg/L				07/19/17	10:09
QC1203833817	428121003	PS									
Nitrogen, Nitrate/Nitrite	1.00	U	ND		1.03	mg/L		102 (90%-110%)		07/19/17	10:18
QC1203834041	428213005	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.177		1.18	mg/L		100 (90%-110%)		07/19/17	13:33
Batch	1683435										
QC1203833864	428121003	DUP									
Nitrogen, Ammonia			0.0606		0.0804	mg/L	28.1 ^	(+/-0.050)	KLP1	07/21/17	12:57
QC1203833988	428213005	DUP									
Nitrogen, Ammonia			0.179		0.153	mg/L	15.7 ^	(+/-0.050)		07/21/17	13:09
QC1203833863	LCS										
Nitrogen, Ammonia	1.00				1.07	mg/L		107 (90%-110%)		07/21/17	13:03

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1683435										
QC1203833862	MB										
Nitrogen, Ammonia			J	0.0242	mg/L				KLP1	07/21/17	12:51
QC1203833865	428121003	MS									
Nitrogen, Ammonia	1.00	0.0606		1.10	mg/L		104	(90%-110%)		07/21/17	12:58
QC1203833989	428213005	MS									
Nitrogen, Ammonia	1.00	0.179		1.22	mg/L		104	(90%-110%)		07/21/17	13:10
Batch	1683499										
QC1203833992	428121003	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	07/21/17	16:48
QC1203833993	428213005	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			07/21/17	16:14
QC1203833991	LCS										
Nitrogen, Total Kjeldahl	1.00			0.954	mg/L		95.4	(90%-110%)		07/21/17	16:50
QC1203833990	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					07/21/17	15:59
QC1203833994	428121003	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	0.917	mg/L		91.7	(90%-110%)		07/21/17	16:03
QC1203833995	428213005	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.30	mg/L		130*	(90%-110%)		07/21/17	16:15
Batch	1683501										
QC1203833998	428121003	DUP									
Phosphorus, Total as P		U	ND	J	0.0208	mg/L	200		KLP1	07/21/17	10:28
QC1203833999	428213005	DUP									
Phosphorus, Total as P		J	0.031	J	0.0334	mg/L	7.45 ^	(+/-0.050)		07/21/17	10:31

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1683501										
QC1203833997	LCS										
Phosphorus, Total as P	1.00			1.02	mg/L		102	(80%-124%)	KLP1	07/21/17	10:26
QC1203833996	MB										
Phosphorus, Total as P			U	ND	mg/L					07/21/17	10:26
QC1203834000	428121003	MS									
Phosphorus, Total as P	1.00	U	ND	1.03	mg/L		102	(63%-139%)		07/21/17	10:29
QC1203834001	428213005	MS									
Phosphorus, Total as P	1.00	J	0.031	1.09	mg/L		106	(63%-139%)		07/21/17	10:31
<b>Solids Analysis</b>											
Batch	1683492										
QC1203833967	427997004	DUP									
Total Dissolved Solids			116	116	mg/L	0		(0%-5%)	KLP1	07/20/17	14:29
QC1203833968	428213006	DUP									
Total Dissolved Solids			184	179	mg/L	3.15		(0%-5%)		07/20/17	14:29
QC1203833966	LCS										
Total Dissolved Solids	300			290	mg/L		96.7	(95%-105%)		07/20/17	14:29
QC1203833965	MB										
Total Dissolved Solids			U	ND	mg/L					07/20/17	14:29
<b>Titration and Ion Analysis</b>											
Batch	1683487										
QC1203833955	427997002	DUP									
Conductivity			133	132	umhos/cm	0.606		(0%-10%)	VH1	07/25/17	11:24
QC1203833954	LCS										
Conductivity	1410			1420	umhos/cm		101	(95%-105%)		07/25/17	11:22

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1685418										
QC1203838683	428121003	DUP									
Alkalinity, Total as CaCO3		U	ND	U	ND	mg/L	N/A		RXB5	07/26/17	15:16
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203838682	LCS										
Alkalinity, Total as CaCO3	100				108	mg/L		108 (90%-110%)		07/26/17	14:42
QC1203838687	428121003	MS									
Alkalinity, Total as CaCO3	100	U	ND		110	mg/L		109 (80%-120%)		07/26/17	15:18
Batch	1685419										
QC1203838700	428121003	DUP									
pH		H	6.05	H	6.06	SU	0.165	(0%-5%)	RXB5	07/26/17	15:16
QC1203838699	LCS										
pH	7.00				6.98	SU		99.7 (99%-101%)		07/26/17	14:42

### Notes:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.



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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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.