

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:

General Engineering Charleston SC	<h1 style="margin:0;">Chain of Custody/Analysis Request</h1>	COC/Lab Request #: 2017-2827 Page 1 of 1
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Client Contact:				Lab Agreement #:										Site Name: Los Alamos National Laboratory										Rad Screening Info: Yes, Below Background loc No No Lab Reporting Limit Type: Sample Quantitation Limit MOL																																																																																																												
Project Number: APEP				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">MSGP-Hg</td> <td style="width:5%;">WSP-8260B-VOA</td> <td style="width:5%;">WSP-8330B-NMED HEXMOD</td> <td style="width:5%;">WSP-All Metals</td> <td style="width:5%;">WSP-CN(T)</td> <td style="width:5%;">WSP-GENINORG+PerChlorate</td> <td style="width:5%;">WSP-NH3+NO3/NO2+PO4</td> <td style="width:5%;">WSP-TKN+TOC</td> <td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td><td style="width:5%;"></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>										MSGP-Hg	WSP-8260B-VOA	WSP-8330B-NMED HEXMOD	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-NH3+NO3/NO2+PO4	WSP-TKN+TOC																																																																																																												Analysis Turnaround Time: 24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/> 7 Days - <input type="checkbox"/> 14 Days - <input type="checkbox"/> 21 Days - <input type="checkbox"/> 28 Days - <input checked="" type="checkbox"/>			
MSGP-Hg	WSP-8260B-VOA	WSP-8330B-NMED HEXMOD	WSP-All Metals											WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-NH3+NO3/NO2+PO4	WSP-TKN+TOC																																																																																																																			
Field Sample ID	Sample Date	Sample Time	Sample Matrix																																																																																																																																	
CAWA-17-142855	Sep 15 2017	09:37	W				1		1	1																																																																																																																										
CAWA-17-142890	Sep 15 2017	09:39	W	1	2	3		1			1																																																																																																																									
CAWA-17-143021	Sep 15 2017	09:39	W		2																																																																																																																															
CAWA-17-142861	Sep 15 2017	12:42	W				1		1	1																																																																																																																										
CAWA-17-142896	Sep 15 2017	12:42	W	1	2	3		1			1																																																																																																																									
CAWA-17-142936	Sep 15 2017	12:42	W																																																																																																																																	
CAWA-17-143025	Sep 15 2017	12:42	W		2																																																																																																																															
CAWA-17-142879	Sep 15 2017	12:15	W				1		1	1																																																																																																																										
CAWA-17-142914	Sep 15 2017	12:15	W	1	2	3		1			1																																																																																																																									
CAWA-17-143029	Sep 15 2017	12:15	W		2																																																																																																																															

Special Instructions:							
Relinquished by:	Print Name:	Date/Time:	Received by:	Date/Time:	Print Name:	Date/Time:	
Shawn Sherwood	Shawn Sherwood	9/17/17					
Relinquished by:	Print Name:	Date/Time:	Received by:	Date/Time:	Print Name:	Date/Time:	
Relinquished by:	Print Name:	Date/Time:	Received by:	Date/Time:	Print Name:	Date/Time:	

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142855

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/17	ok	FIELD MATRIX:	WG	NA
TIME COLLECTED (HH:MM):	9:39		MEDIA:	UA	
PRS ID:	ok		SAMPLE TECH CODE:	PP	
LOCATION ID:	16-61439		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS: none

LOCATION COMMENTS: none

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): Maurice Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 9/15/17 1330	RECEIVED BY MATT ENGLERT (Printed Name) <i>M. Englert</i> (Signature) <i>M. Englert</i>	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142861

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1242		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CdV-16-1(i)		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO (NA)

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

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen _____ *KT 9/15/17*
 Oxidation-Reduction Potential _____ pH _____ Flow (in gpm) _____
 Temperature _____ Turbidity _____ Specific Conductance _____

COLLECTED BY (PRINT): M. Shendo & D. Hughes

RELINQUISHED BY (Printed Name) <i>Darren Hughes</i> (Signature) <i>[Signature]</i>	Date/Time 9/15/17 1330	RECEIVED BY <i>MAT ENGELERT</i> (Printed Name) <i>[Signature]</i> (Signature)	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142879

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09/15/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1215		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	TV 9-15-17 RSP	
LOCATION ID:	R-25b		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): A. Vigil, T. Bunham

RELINQUISHED BY (Printed Name) <i>Adrian Vigil</i> (Signature) <i>Adrian Vigil</i>	Date/Time 9-15-17 1310	RECEIVED BY <i>S. Sherwood</i> (Printed Name) <i>S. Sherwood</i> (Signature) <i>S. Sherwood</i>	Date/Time 9/15/17 1310
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142890

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/17	o/s	FIELD MATRIX:	WG	o/s
TIME COLLECTED (HH:MM):	9:39		MEDIA:	UA	
PRS ID:	o/s		SAMPLE TECH CODE:	PP	
LOCATION ID:	16-61439		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	NA		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500 ML POLY 9/15/17	1	HNO3	y	NA
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: HE spot Test Negative.

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	0939	HH:MM	Dissolved Oxygen	7.43	Flow (in gpm)	
Oxidation-Reduction Potential	NA		pH	6.62	Specific Conductance	214.5
Temperature	13.1		Turbidity	8.7		

COLLECTED BY (PRINT): M. Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>M. Shendo</i>	Date/Time 9/15/17 1330	RECEIVED BY MATT ENGERT (Printed Name) <i>M. Engert</i> (Signature) <i>M. Engert</i>	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142896

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1242		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CdV-16-1(i)		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	MSGP-Hg	1000 500 ML POLY 8/31/17	1	HNO3	Y	NA
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1242	HH:MM	Dissolved Oxygen	6.15	Flow (in gpm)	0.92
Oxidation-Reduction Potential	302.5		pH	6.80	Specific Conductance	179.8
Temperature	12.4		Turbidity	0.78		

COLLECTED BY (PRINT): M. Shendo & D. Hughes

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 9/15/17 1330	RECEIVED BY MATT ENGERT (Printed Name) (Signature)	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142914

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09/15/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1215		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-25b		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500 ML POLY 8/31/17	1	HNO3	Y	NA
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: bot TV 9-15-17 windy while sampling

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	1215	HH:MM	Dissolved Oxygen	1.00 mg/L	Flow (in gpm)	0.19
Oxidation-Reduction Potential	130.0 mV		pH	6.81	Specific Conductance	697 μ S/cm
Temperature	11.9°C		Turbidity	23.9 NTU		

COLLECTED BY (PRINT): A. Vigil, T. Bonham

RELINQUISHED BY (Printed Name) ANDREW VIGIL (Signature) <i>Andrew Vigil</i>	Date/Time 9-15-17 1310	RECEIVED BY <i>S. Sherwood</i> (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 9/15/17 1310
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-143021

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	9:39		MEDIA:	UA	
PRS ID:	ok		SAMPLE TECH CODE:	DC	
LOCATION ID:	16-61439		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:	NA		SAMPLE USAGE:	QC	
BOTTOM DEPTH:	NA		EXCAVATED:		YES / NO <input checked="" type="radio"/> NA

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

SAMPLE COMMENTS: Field Trip Blank seal broken and approved

LOCATION COMMENTS: none

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): M. Shundo

RELINQUISHED BY (Printed Name) <i>Mayra Stundo</i> (Signature) <i>Mayra Stundo</i>	Date/Time 9/15/17 1330	RECEIVED BY <i>MATT ENGLERT</i> (Printed Name) <i>M-Englert</i> (Signature)	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142936

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1242		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	CdV-16-1(i)		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-EES6-Tracer+Br	40 mL Glass	1	ICE	Y	NA

SAMPLE COMMENTS: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

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

KT 9/15/17

COLLECTED BY (PRINT): M. Shendo, D. Hughes

RELINQUISHED BY (Printed Name) <i>Darren Hughes</i> (Signature) <i>[Signature]</i>	Date/Time 9/15/17 1330	RECEIVED BY <i>MATT ENGEL</i> (Printed Name) <i>[Signature]</i> (Signature)	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-143025

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	9/15/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1242		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	CdV-16-1(i)		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 8/31/17	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 + M. Shendo

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 9/15/17 1330	RECEIVED BY MATT ENGEL (Printed Name) (Signature)	Date/Time 9-15-17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-143029

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09/15/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1215		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-25b		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	ET 8/31/17 HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	TV 9-15-17	Dissolved Oxygen	_____	Flow (in gpm)	_____
Oxidation-Reduction Potential	_____			pH	_____	Specific Conductance	_____
Temperature	_____			Turbidity	_____		

COLLECTED BY (PRINT): A. Vigil, T. Bonham

RELINQUISHED BY (Printed Name) A. Vigil (Signature) A. Vigil	Date/Time 9-15-17 1310	RECEIVED BY (Printed Name) S. Sherwood (Signature) S. Sherwood	Date/Time 9/15/17 1310
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

coc: 2017-2827

TEST - Field Screen		YES	NO	NA
The sample has field screening measurements of alpha activity and beta activity.			X	
Activity (dpm/100cm ²)	Sampled Location			
Alpha detectable and < 20,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			
Alpha > 125 and < 20,000	other locations			
Beta > 1,500 and < 100,000	any location			
Alpha activity $\geq 20,000$ dpm/100cm ² and beta activity $\geq 100,000$ dpm/100cm ² and ≥ 0.5 mR/hr on the external surface of the package.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on field screening measurements of alpha and beta activity.				

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.		X		
Activity (pCi/g)	Sampled Location			
<ul style="list-style-type: none"> Am-241 > 27 and < 27,000 Cs-137 > 270 and < 270,000 Pu-238 > 27 and < 27,000 Pu-239/240 > 27 and < 27,000 Th-228 > 27 and < 27,000 U-238 > 270 and < 270,000 H-3 > 27,000,000 and < 27,000,000,000 	The sampling location is within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-15, TA-35, TA-36, TA-39, TA-48 or TA-49.		X	
<ul style="list-style-type: none"> Am-241, Pu-238, Pu-239/240, or Th-228 $\geq 27,000$ U-238 $\geq 270,000$ H-3 $\geq 27,000,000,000$ 			X	
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on prior analytical measurements of radioactive isotopes.			X	

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

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) Sherri Sherwood	9/18/17
(Signature) <i>Sherri Sherwood</i>	3pm

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2827

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
433059	EPA:120.1	2				
433059	EPA:150.1	2				
433059	EPA:160.1	2				
433059	EPA:170.0	4		3		
433059	EPA:245.2	4				
433059	EPA:300.0	2				
433059	EPA:310.1	2				
433059	EPA:335.4	2				
433059	EPA:350.1	2				
433059	EPA:351.2	2				
433059	EPA:353.2	2				
433059	EPA:365.4	2				
433059	SM:A2340B	2				
433059	SW-846:6010C	2				
433059	SW-846:6020	2				
433059	SW-846:6850	2				
433059	SW-846:8260B	2		3		
433059	SW-846:8330B	2				
433059	SW-846:9060	2				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
433059	EPA:120.1	1705527	1705527	2										1				1			
433059	EPA:150.1	1701903	1701903	2										1				2			
433059	EPA:160.1	1702695	1702695	2					1					1				1			
433059	EPA:170.0	NA	NA	4		3															
433059	EPA:245.2	1704572	1704569	4					1	1				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
433059	EPA:300.0	1703592	1703592	2					1					1			1				
433059	EPA:310.1	1701895	1701895	2						1				1			1				
433059	EPA:335.4	1701309	1701308	2					1	1				1			1				
433059	EPA:350.1	1702222	1702221	2					1	1				1			1				
433059	EPA:351.2	1701316	1701315	2					1	1				1			1				
433059	EPA:353.2	1703447	1703447	2					1					1			1				
433059	EPA:365.4	1701314	1701313	2					1	1				1			1				
433059	SM:A2340B	1709150	1709150	2																	
433059	SW-846:6010C	1701831	1701830	2					1	1				1			1				
433059	SW-846:6020	1701824	1701822	2					1	1				1			1				
433059	SW-846:6850	1702207	1702204	2					1	1	1			1							
433059	SW-846:8260B	1704244	1704244	2		3			2					4							
433059	SW-846:8330B	1702490	1702489	2					1	1	1			1							
433059	SW-846:9060	1701620	1701620	2					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	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142887	1203886676	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203886675	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142856	1203878364	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142879	1203878365	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203878363	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142879	1203879996	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:160.1	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203879995	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203879994	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-17-142890	433059002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142896	433059005	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142914	433059008	TEST	1	0	0	0
EPA:170.0	VOC	CAWA-17-143021	433059003	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-143025	433059006	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-143029	433059009	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142890	433059002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142896	433059005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142914	433059008	TEST	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203884542	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203884541	MB	1	0	0	0
EPA:245.2	INORGANIC	WT_SEP_URB-17-145671	1203884543	DUP	1	0	0	0
EPA:245.2	INORGANIC	WT_SEP_URB-17-145671	1203884545	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142868	1203882343	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203882342	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203882341	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142879	1203878344	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142879	1203878354	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203878342	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142890	433059002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142896	433059005	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142914	433059008	TEST	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203876740	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203876739	MB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WST16-17-147285	1203876741	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:335.4	GENERAL CHEMISTRY	WST16-17-147285	1203876745	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142855	1203878978	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142855	1203878979	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203878977	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203878976	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142890	433059002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142896	433059005	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142914	433059008	TEST	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203876777	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203876776	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST05-17-145280	1203876778	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST05-17-145280	1203876780	MS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142855	1203881949	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203881948	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203881947	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142855	433059001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142861	433059004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142865	1203876770	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142865	1203876773	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142879	433059007	TEST	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203876769	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203876768	MB	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-142855	433059001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-142861	433059004	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-142879	433059007	TEST	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142855	1203878216	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142855	1203878217	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-142855	433059001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142861	433059004	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142879	433059007	TEST	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203878215	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203878214	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142855	1203878201	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142855	1203878202	MS	0	0	11	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6020	INORGANIC	CAWA-17-142855	433059001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142861	433059004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142879	433059007	TEST	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203878200	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203878199	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142855	433059001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142856	1203878945	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142856	1203878946	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142861	433059004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142879	433059007	TEST	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203878944	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203878943	MB	1	0	0	0
SW-846:8260B	VOC	CAWA-17-142890	433059002	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-142896	433059005	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-142914	433059008	TEST	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143021	433059003	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143025	433059006	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143029	433059009	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203883750	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203883751	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203884483	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203884484	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203883748	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203884482	MB	80	3	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142890	1203879545	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142890	1203879546	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142890	433059002	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142896	433059005	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142914	433059008	TEST	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203879544	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203879543	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142890	433059002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142896	433059005	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142914	433059008	TEST	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203877658	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203877657	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	WT_SEP_URB-17-145671	1203877660	DUP	1	0	0	0

3. Are any analytes missing?

DATA VALIDATION REPORT

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	1203878214	METHOD BLANK	SW-846:6010C	W	Sodium	146	J	ug/L	300
CAWA-17-143021	433059003	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	
CAWA-17-143025	433059006	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	
CAWA-17-143029	433059009	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	

No.

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
WST05-17-145280	1203876780		EPA:351.2	Total Kjeldahl Nitrogen	1701315	09-21-2017	W	112		110	90	10		
CAWA-17-142855	1203878217		SW-846:6010C	Barium	1701830	09-25-2017	W	67.7		125	75			

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Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAWA-17-142855	1203878217		SW-846:6010C	Barium	1701830	09-25-2017	W	67.7		125	75			

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
16-61439	2017-2827	CAWA-17-142855	REG	INIT	INORGANIC	SW-846:6010C	Barium		J-	I6a	Y	3730	ug/L	3730	ug/L			W	09/15/2017		1701831	VAL	Y

Reason Code

Description

DATA VALIDATION REPORT

Reason Code

Description

I6a

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

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142855	16-61439	REG	EPA:120.1	0	1
CAWA-17-142855	16-61439	REG	EPA:150.1	0	1
CAWA-17-142855	16-61439	REG	EPA:160.1	0	1
CAWA-17-142855	16-61439	REG	EPA:170.0	0	1
CAWA-17-142855	16-61439	REG	EPA:245.2	0	1
CAWA-17-142855	16-61439	REG	EPA:300.0	0	4
CAWA-17-142855	16-61439	REG	EPA:310.1	0	2
CAWA-17-142855	16-61439	REG	EPA:350.1	0	1
CAWA-17-142855	16-61439	REG	EPA:353.2	0	1
CAWA-17-142855	16-61439	REG	EPA:365.4	0	1
CAWA-17-142855	16-61439	REG	SM:A2340B	0	1
CAWA-17-142855	16-61439	REG	SW-846:6010C	0	17
CAWA-17-142855	16-61439	REG	SW-846:6020	0	11
CAWA-17-142855	16-61439	REG	SW-846:6850	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:120.1	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:150.1	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:160.1	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:170.0	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:245.2	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:300.0	0	4
CAWA-17-142861	CdV-16-1(i)	REG	EPA:310.1	0	2
CAWA-17-142861	CdV-16-1(i)	REG	EPA:350.1	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:353.2	0	1
CAWA-17-142861	CdV-16-1(i)	REG	EPA:365.4	0	1
CAWA-17-142861	CdV-16-1(i)	REG	SM:A2340B	0	1
CAWA-17-142861	CdV-16-1(i)	REG	SW-846:6010C	0	17

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142861	CdV-16-1(i)	REG	SW-846:6020	0	11
CAWA-17-142861	CdV-16-1(i)	REG	SW-846:6850	0	1
CAWA-17-142879	R-25b	TEST	EPA:120.1	0	1
CAWA-17-142879	R-25b	TEST	EPA:150.1	0	1
CAWA-17-142879	R-25b	TEST	EPA:160.1	0	1
CAWA-17-142879	R-25b	TEST	EPA:170.0	0	1
CAWA-17-142879	R-25b	TEST	EPA:245.2	0	1
CAWA-17-142879	R-25b	TEST	EPA:300.0	0	4
CAWA-17-142879	R-25b	TEST	EPA:310.1	0	2
CAWA-17-142879	R-25b	TEST	EPA:350.1	0	1
CAWA-17-142879	R-25b	TEST	EPA:353.2	0	1
CAWA-17-142879	R-25b	TEST	EPA:365.4	0	1
CAWA-17-142879	R-25b	TEST	SM:A2340B	0	1
CAWA-17-142879	R-25b	TEST	SW-846:6010C	0	17
CAWA-17-142879	R-25b	TEST	SW-846:6020	0	11
CAWA-17-142879	R-25b	TEST	SW-846:6850	0	1
CAWA-17-142890	16-61439	REG	EPA:170.0	0	1
CAWA-17-142890	16-61439	REG	EPA:245.2	0	1
CAWA-17-142890	16-61439	REG	EPA:335.4	0	1
CAWA-17-142890	16-61439	REG	EPA:351.2	0	1
CAWA-17-142890	16-61439	REG	SW-846:8260B	0	80
CAWA-17-142890	16-61439	REG	SW-846:8330B	0	23
CAWA-17-142890	16-61439	REG	SW-846:9060	0	1
CAWA-17-142896	CdV-16-1(i)	REG	EPA:170.0	0	1
CAWA-17-142896	CdV-16-1(i)	REG	EPA:245.2	0	1
CAWA-17-142896	CdV-16-1(i)	REG	EPA:335.4	0	1
CAWA-17-142896	CdV-16-1(i)	REG	EPA:351.2	0	1
CAWA-17-142896	CdV-16-1(i)	REG	SW-846:8260B	0	80
CAWA-17-142896	CdV-16-1(i)	REG	SW-846:8330B	0	23
CAWA-17-142896	CdV-16-1(i)	REG	SW-846:9060	0	1
CAWA-17-142914	R-25b	TEST	EPA:170.0	0	1
CAWA-17-142914	R-25b	TEST	EPA:245.2	0	1
CAWA-17-142914	R-25b	TEST	EPA:335.4	0	1
CAWA-17-142914	R-25b	TEST	EPA:351.2	0	1
CAWA-17-142914	R-25b	TEST	SW-846:8260B	0	80
CAWA-17-142914	R-25b	TEST	SW-846:8330B	0	23
CAWA-17-142914	R-25b	TEST	SW-846:9060	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-143021	16-61439	FTB	EPA:170.0	0	1
CAWA-17-143021	16-61439	FTB	SW-846:8260B	0	80
CAWA-17-143025	CdV-16-1(i)	FTB	EPA:170.0	0	1
CAWA-17-143025	CdV-16-1(i)	FTB	SW-846:8260B	0	80
CAWA-17-143029	R-25b	FTB	EPA:170.0	0	1
CAWA-17-143029	R-25b	FTB	SW-846:8260B	0	80

September 26, 2017

gel.com

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

Re: LANL- WQH Water Samples
Work Order: 433059
SDG: 2017-2827

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on September 19, 2017, and analyzed for Explosives by LCMSMS, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2017-2827
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 433059
SDG: 2017-2827

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 433059
SDG # : 2017-2827**

September 26, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on September 19, 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 temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). Collect time for sample 433059001(CAWA-17-142855) is 09:39 but, on chain of custody is 09:37..

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
433059001	CAWA-17-142855
433059002	CAWA-17-142890
433059003	CAWA-17-143021
433059004	CAWA-17-142861
433059005	CAWA-17-142896
433059006	CAWA-17-143025
433059007	CAWA-17-142879
433059008	CAWA-17-142914
433059009	CAWA-17-143029

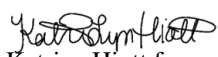
Case Narrative

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

Data Package

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

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


Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 26 September 2017

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

Chain of Custody and Supporting Documentation

General Engineering

Charleston

55

Chain of Custody/Analysis Request

COC/Lab Request #:

2017-2827

Page 1 of 1

[illegible]

Special Instructions:

Relinquished by: <i>Devered</i>	Print Name: <i>Devered</i>	Date/Time: <i>9/18/2009</i>	Received by: <i>[Signature]</i>	Date/Time: <i>9/18/2009</i>	Print Name: <i>Devered</i>	Date/Time: <i>9/19/2009</i>
Relinquished by:	Print Name:	Date/Time:	Received by:	Date/Time:	Print Name:	Date/Time:
Relinquished by:	Print Name:	Date/Time:	Received by:	Date/Time:	Print Name:	Date/Time:

COC: 2017-2827

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

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.		X		
Activity (pCi/g)	Sampled Location			
<ul style="list-style-type: none"> Am-241 > 27 and < 27,000 Cs-137 > 270 and < 270,000 Pu-238 > 27 and < 27,000 Pu-239/240 > 27 and < 27,000 Th-228 > 27 and < 27,000 U-238 > 270 and < 270,000 H-3 > 27,000,000 and < 27,000,000,000 	The sampling location is within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-15, TA-35, TA-36, TA-39, TA-48 or TA-49.		X	
<ul style="list-style-type: none"> Am-241, Pu-238, Pu-239/240, or Th-228 ≥ 27,000 U-238 ≥ 270,000 H-3 ≥ 27,000,000,000 			X	
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on prior analytical measurements of radioactive isotopes.			X	

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

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) Sherri Sherwood	9/18/17
(Signature) <i>Sherri Sherwood</i>	3pm

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18SEP17
ACTWGT: 31.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

CHARLESTON SC 29407

(843) 656-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18SEP17
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

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

CHARLESTON SC 29407

(843) 656-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



3 of 3
MPS# 5908 1782 7383
0263

Mstr# 5908 1782 7361

X7 RBWA

TUE - 19 SEP 10:30
PRIORITY OVERNIGHT

TRK#
0201

1 of 3
5908 1782 7361

MASTER

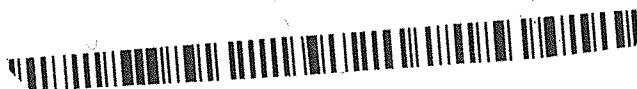
2940
SC-US CH

X7 RBWA

TUE - 19 SEP 10:30
PRIORITY OVERNIGHT

2940

SC-US CH



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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 18SEP17
ACTWGT: 53.0 LB MAN
CAD: 0014176/CAFE2916

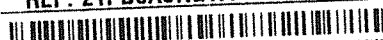
BILL SENDER

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

CHARLESTON SC 29407

(843) 656-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



2 of 3
MPS# 5908 1782 7372
0263

Mstr# 5908 1782 7361

X7 RBWA

TUE - 19 SEP 10:
PRIORITY OVERNIGHT

2940

SC-US C





Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>433089</u>	
Received By: <u>ZKW</u>		Date Received: <u>9/19/17</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 7372</u> <u>5908 1782 7383</u> <u>5908 1782 7361</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet ice <u>Ice Packs</u> Dry ice None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>3°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No ___ N/A ___ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>collect time for -142855 is 9:39 on sample</u>
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

KHett

Date

9/20/17

Page

1 of 1

GL-CHL-SR-001 Rev 5

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 #: 2017-2827
Work Order #: 433059**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1704244

Sample Analysis

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

Sample ID	Client ID
433059002	CAWA-17-142890
433059003	CAWA-17-143021
433059005	CAWA-17-142896
433059006	CAWA-17-143025
433059008	CAWA-17-142914
433059009	CAWA-17-143029
1203883748	Method Blank (MB)
1203883750	Laboratory Control Sample (LCS)
1203883751	Laboratory Control Sample (LCS)
1203883754	433282004(CALA-17-144880) Post Spike (PS)
1203883755	433282004(CALA-17-144880) Post Spike (PS)
1203883756	433282004(CALA-17-144880) Post Spike Duplicate (PSD)
1203883757	433282004(CALA-17-144880) Post Spike Duplicate (PSD)
1203884482	Method Blank (MB)
1203884483	Laboratory Control Sample (LCS)
1203884484	Laboratory Control Sample (LCS)

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

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

SOP Reference

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

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the

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

Initial Calibration

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

Continuing Calibration Verification Requirements

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

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

Target analytes were detected in the blank 1203883748 (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 433282004 (CALA-17-144880) 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:

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2827 GEL Work Order: 433059

The Qualifiers in this report are defined as follows:

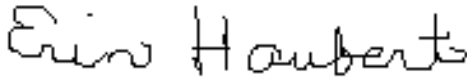
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that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

Review/Validation

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

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

Signature:



Name: Erin Haubert

Date: 13 OCT 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 433059002

Date Collected: 09/15/2017 09:39

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-142890

Batch ID: 1704244

Run Date: 09/27/2017 15:08

Prep Date: 09/27/2017 15:08

Data File: 092717V6\6A313.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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827
Lab Sample ID: 433059002

Client ID: CAWA-17-142890
Batch ID: 1704244
Run Date: 09/27/2017 15:08
Prep Date: 09/27/2017 15:08
Data File: 092717V6\6A313.D

Date Collected: 09/15/2017 09:39
Date Received: 09/19/2017 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059002

Date Collected: 09/15/2017 09:39

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA6.I

Dilution: 1

Run Date: 09/27/2017 15:08

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 09/27/2017 15:08

Data File: 092717V6\6A313.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.3	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	51.5	50.0	ug/L 103	(70%-131%)
Toluene-d8	48.2	50.0	ug/L 96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.592	5.32	ug/L	0	J
	unknown siloxane	13.75	10.6	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059003

Date Collected: 09/15/2017 09:39

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-143021

Batch ID: 1704244

Run Date: 09/27/2017 15:37

Prep Date: 09/27/2017 15:37

Data File: 092717V6\6A314.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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059003

Date Collected: 09/15/2017 09:39

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-143021

Batch ID: 1704244

Run Date: 09/27/2017 15:37

Prep Date: 09/27/2017 15:37

Data File: 092717V6\6A314.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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059003

Date Collected: 09/15/2017 09:39

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA6.I

Dilution: 1

Run Date: 09/27/2017 15:37

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 09/27/2017 15:37

Data File: 092717V6\6A314.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.7	50.0	ug/L 99	(71%-134%)
Bromofluorobenzene	50.0	50.0	ug/L 100	(70%-131%)
Toluene-d8	47.5	50.0	ug/L 95	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	11.348	8.12	ug/L	0	J
	unknown siloxane	13.75	18.3	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059005

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-142896

Batch ID: 1704244

Run Date: 09/27/2017 16:05

Prep Date: 09/27/2017 16:05

Data File: 092717V6\6A315.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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 433059005

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-142896

Batch ID: 1704244

Run Date: 09/27/2017 16:05

Prep Date: 09/27/2017 16:05

Data File: 092717V6\6A315.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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	J	0.990	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059005

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA6.I

Dilution: 1

Run Date: 09/27/2017 16:05

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 09/27/2017 16:05

Column: DB-624

Data File: 092717V6\6A315.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		1.35	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	0.300	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.8	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	50.1	50.0	ug/L 100	(70%-131%)
Toluene-d8	48.0	50.0	ug/L 96	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.68	5.57	ug/L	0	J
	unknown siloxane	13.75	11.3	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 433059006

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-143025

Batch ID: 1704244

Run Date: 09/27/2017 16:33

Prep Date: 09/27/2017 16:33

Data File: 092717V6\6A316.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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059006

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-143025

Batch ID: 1704244

Run Date: 09/27/2017 16:33

Prep Date: 09/27/2017 16:33

Data File: 092717V6\6A316.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	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059006

Date Collected: 09/15/2017 12:42

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA6.I

Dilution: 1

Run Date: 09/27/2017 16:33

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 09/27/2017 16:33

Data File: 092717V6\6A316.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	49.9	50.0	ug/L 100	(70%-131%)
Toluene-d8	47.7	50.0	ug/L 95	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	11.348	5.29	ug/L	0	J
	unknown siloxane	13.75	11	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059008

Date Collected: 09/15/2017 12:15

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-142914

Batch ID: 1704244

Run Date: 09/27/2017 17:51

Prep Date: 09/27/2017 17:51

Data File: 092717V4\4B318.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	J	0.700	ug/L	0.300	1.00
75-25-2	Bromoform	J	0.420	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059008

Date Collected: 09/15/2017 12:15

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-142914

Batch ID: 1704244

Run Date: 09/27/2017 17:51

Prep Date: 09/27/2017 17:51

Data File: 092717V4\4B318.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	J	0.850	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	J	0.990	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059008

Date Collected: 09/15/2017 12:15

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-142914

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA4.I

Dilution: 1

Run Date: 09/27/2017 17:51

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 09/27/2017 17:51

Column: DB-624

Data File: 092717V4\4B318.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.3	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	46.2	50.0	ug/L 92	(70%-131%)
Toluene-d8	50.6	50.0	ug/L 101	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	4.27	42.8	ug/L	0	J
	unknown siloxane	12.107	9.95	ug/L	0	J
	unknown siloxane	14.497	23.5	ug/L	0	J
	unknown siloxane	16.448	5.88	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059009

Date Collected: 09/15/2017 12:15

Date Received: 09/19/2017 09:05

Matrix: W

Client ID: CAWA-17-143029

Batch ID: 1704244

Run Date: 09/27/2017 17:01

Prep Date: 09/27/2017 17:01

Data File: 092717V6\6A317.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	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827
Lab Sample ID: 433059009

Client ID: CAWA-17-143029
Batch ID: 1704244
Run Date: 09/27/2017 17:01
Prep Date: 09/27/2017 17:01
Data File: 092717V6\6A317.D

Date Collected: 09/15/2017 12:15
Date Received: 09/19/2017 09:05
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 433059009

Date Collected: 09/15/2017 12:15

Date Received: 09/19/2017 09:05

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA6.I

Dilution: 1

Run Date: 09/27/2017 17:01

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 09/27/2017 17:01

Data File: 092717V6\6A317.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.6	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	52.6	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.2	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	11.348	7.64	ug/L	0	J
	unknown siloxane	13.75	10.5	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2827**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203883750	LCS for batch 1704244	101	96	101
1203883751	LCS for batch 1704244	101	95	100
1203883748	MB for batch 1704244	99	96	100
1203884483	LCS for batch 1704244	100	103	92
1203884484	LCS for batch 1704244	100	102	92
1203884482	MB for batch 1704244	99	102	93
433059002	CAWA-17-142890	103	96	103
433059003	CAWA-17-143021	99	95	100
433059005	CAWA-17-142896	104	96	100
433059006	CAWA-17-143025	102	95	100
433059009	CAWA-17-143029	107	100	105
433059008	CAWA-17-142914	105	101	92
1203883754	CALA-17-144880PS	103	98	100
1203883756	CALA-17-144880PSD	99	96	98
1203883755	CALA-17-144880PS	102	95	100
1203883757	CALA-17-144880PSD	100	95	99

Surrogate**Acceptance Limits**

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

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

BFB = Bromofluorobenzene (70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203883750

Instrument: VOA6.I

Analysis Date: 09/27/2017 10:28

Dilution: 1

Analyst: JPI

Purge Vol: 5 mL

Batch ID: 1704244

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	100	100	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1170	93	61-125
67-64-1	LCS Acetone	250	0.0	302	121	48-157
74-88-4	LCS Iodomethane	250	0.0	248	99	72-128
75-15-0	LCS Carbon disulfide	250	0.0	249	100	69-138
108-05-4	LCS Vinyl acetate	250	0.0	266	107	67-125
78-93-3	LCS 2-Butanone	250	0.0	267	107	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	238	95	66-124
591-78-6	LCS 2-Hexanone	250	0.0	247	99	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	73.8	148	40-160
74-87-3	LCS Chloromethane	50.0	0.0	57.5	115	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	56.3	113	65-137
74-83-9	LCS Bromomethane	50.0	0.0	57.5	115	63-137
75-00-3	LCS Chloroethane	50.0	0.0	55.7	111	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	58.1	116	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.0	102	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	52.1	104	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	52.0	104	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	50.8	102	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.3	107	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	52.1	104	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	52.7	105	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203883750

Instrument: VOA6.I

Analysis Date: 09/27/2017 10:28

Dilution: 1

Analyst: JPI

Purge Vol: 5 mL

Batch ID: 1704244

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	53.4	107	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	52.8	106	76-125
67-66-3	LCS Chloroform	50.0	0.0	52.6	105	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	52.7	105	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	51.4	103	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	55.3	111	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	51.5	103	74-122
71-43-2	LCS Benzene	50.0	0.0	50.0	100	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	52.9	106	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	51.3	103	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	52.1	104	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	53.9	108	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.4	107	78-131
108-88-3	LCS Toluene	50.0	0.0	48.8	98	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	52.9	106	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	50.5	101	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	47.9	96	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	49.7	99	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	54.8	110	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	52.2	104	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	49.5	99	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	50.2	100	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203883750

Instrument: VOA6.I

Analysis Date: 09/27/2017 10:28

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	49.4	99	74-126
100-42-5	LCS Styrene	50.0	0.0	52.3	105	72-130
75-25-2	LCS Bromoform	50.0	0.0	48.0	96	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	50.1	100	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	50.4	101	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	50.9	102	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.4	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	50.4	101	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	51.6	103	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	50.4	101	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	50.6	101	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	50.6	101	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	51.4	103	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	51.3	103	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	51.1	102	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	50.5	101	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	49.9	100	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	52.1	104	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	44.8	90	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	53.9	108	72-136
91-20-3	LCS Naphthalene	50.0	0.0	52.3	105	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	52.1	104	70-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203883750

Instrument: VOA6.I

Analysis Date: 09/27/2017 10:28

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	53.4	107	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	53.2	106	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	50.8	102	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5260	105	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203883751

Instrument: VOA6.I

Analysis Date: 09/27/2017 11:24

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	242	97	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	275	110	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	244	98	65-122
107-12-0	LCS Propionitrile	250	0.0	243	97	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	248	99	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	246	98	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	239	96	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2500	100	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	47.7	95	66-147

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike

Client ID: CALA-17-144880PS

Matrix: W

Lab Sample ID 1203883754

Instrument: VOA6.I

Analysis Date: 09/27/2017 19:49

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	93.5	94	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1200	96	56-131
67-64-1	PS Acetone	250	0.00 U	138	55	25-155
74-88-4	PS Iodomethane	250	0.00 U	233	93	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	231	93	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	256	102	48-133
78-93-3	PS 2-Butanone	250	0.00 U	157	63	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	234	94	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	185	74	33-138
87-68-3	PS Hexachlorobutadiene	50.0	0.360 BJ	46.6	93	40-147
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.310 BJ	46.8	93	52-135
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	72.7	145	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	54.0	108	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	52.3	105	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	59.7	119	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	54.7	109	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	56.0	112	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	51.9	104	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	48.7	97	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	50.6	101	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	49.1	98	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	50.0	100	65-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2827

Sample Type: Post Spike

Client ID: CALA-17-144880PS

Matrix: W

Lab Sample ID 1203883754

Instrument: VOA6.I

Analysis Date: 09/27/2017 19:49

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	50.3	101	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	50.7	101	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	48.5	97	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	50.2	100	71-130
67-66-3	PS Chloroform	50.0	0.00 U	50.9	102	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	49.4	99	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	47.2	94	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	50.7	101	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	51.7	103	69-130
71-43-2	PS Benzene	50.0	0.00 U	47.9	96	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	49.3	99	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	51.1	102	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	51.5	103	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	49.9	100	70-134
108-88-3	PS Toluene	50.0	0.00 U	46.8	94	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	50.9	102	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	50.6	101	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	48.7	97	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	47.5	95	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	52.8	106	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	52.1	104	71-127

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike

Client ID: CALA-17-144880PS

Matrix: W

Lab Sample ID 1203883754

Instrument: VOA6.I

Analysis Date: 09/27/2017 19:49

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
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	47.1	94	61-130
95-47-6	PS o-Xylene	50.0	0.00 U	46.6	93	62-131
100-42-5	PS Styrene	50.0	0.00 U	48.5	97	59-135
75-25-2	PS Bromoform	50.0	0.00 U	45.6	91	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	46.6	93	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	50.6	101	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	50.7	101	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	47.9	96	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	46.5	93	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	47.7	95	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	46.9	94	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	46.7	93	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	47.3	95	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	47.3	95	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	47.1	94	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	47.2	94	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.3	93	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	46.0	92	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	46.1	92	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	42.6	85	62-141
91-20-3	PS Naphthalene	50.0	0.00 U	49.4	99	62-134

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike

Client ID: CALA-17-144880PS

Matrix: W

Lab Sample ID 1203883754

Instrument: VOA6.I

Analysis Date: 09/27/2017 19:49

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	46.2	92	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	51.3	103	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	47.5	95	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5140	103	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike Duplicate

Client ID: CALA-17-144880PSD

Matrix: W

Lab Sample ID 1203883756

Instrument: VOA6.I

Analysis Date: 09/27/2017 20:17

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00	U	95.3	95	59-132	2 0-20
75-05-8	PSD Acetonitrile	1250	0.00	U	1120	90	56-131	6 0-20
67-64-1	PSD Acetone	250	0.00	U	129	52	25-155	7 0-20
74-88-4	PSD Iodomethane	250	0.00	U	238	95	66-133	2 0-20
75-15-0	PSD Carbon disulfide	250	0.00	U	239	95	61-141	3 0-20
108-05-4	PSD Vinyl acetate	250	0.00	U	245	98	48-133	4 0-20
78-93-3	PSD 2-Butanone	250	0.00	U	146	58	25-143	7 0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	U	218	87	61-127	7 0-20
591-78-6	PSD 2-Hexanone	250	0.00	U	170	68	33-138	8 0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.360	BJ	48.9	97	40-147	5 0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.310	BJ	47.7	95	52-135	2 0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	U	72.8	146	33-164	0 0-20
74-87-3	PSD Chloromethane	50.0	0.00	U	57.2	114	53-139	6 0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	U	55.4	111	58-140	6 0-20
74-83-9	PSD Bromomethane	50.0	0.00	U	61.3	123	59-146	3 0-20
75-00-3	PSD Chloroethane	50.0	0.00	U	55.4	111	65-129	1 0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	U	57.3	115	65-141	2 0-20
60-29-7	PSD Ethyl ether	50.0	0.00	U	50.6	101	69-127	3 0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	U	49.8	100	59-130	2 0-20
75-09-2	PSD Methylene chloride	50.0	0.00	U	50.3	101	62-123	1 0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	U	48.0	96	69-132	2 0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	U	51.4	103	65-127	3 0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike Duplicate

Client ID: CALA-17-144880PSD

Matrix: W

Lab Sample ID 1203883756

Instrument: VOA6.I

Analysis Date: 09/27/2017 20:17

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	50.8	102	67-127	1	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	50.9	102	69-127	0	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	49.3	99	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	50.2	100	71-130	0	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	51.4	103	71-129	1	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	50.1	100	69-139	1	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	48.3	97	67-130	2	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	51.6	103	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	51.0	102	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00 U	48.2	96	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	50.0	100	65-131	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	49.7	99	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	49.8	100	72-129	2	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	52.6	105	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	50.5	101	70-134	1	0-20
108-88-3	PSD Toluene	50.0	0.00 U	47.3	95	60-126	1	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	50.2	100	69-135	1	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	48.4	97	66-125	4	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	47.5	95	67-124	2	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	47.9	96	60-130	1	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	52.1	104	68-143	1	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	50.5	101	71-127	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Post Spike Duplicate

Client ID: CALA-17-144880PSD

Matrix: W

Lab Sample ID 1203883756

Instrument: VOA6.I

Analysis Date: 09/27/2017 20:17

Dilution: 1

Analyst: JPI

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
108-90-7	PSD Chlorobenzene	50.0	0.00	U 47.6	95	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 47.8	96	61-130	1	0-20
95-47-6	PSD o-Xylene	50.0	0.00	U 47.4	95	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00	U 49.3	99	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 44.6	89	64-138	2	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 47.7	95	55-133	2	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 47.8	96	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 48.6	97	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 47.6	95	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 47.5	95	50-133	2	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 48.7	97	53-135	2	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 47.8	96	56-128	2	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 47.6	95	53-130	2	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 47.9	96	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 48.3	97	53-132	2	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 48.4	97	50-138	3	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 48.3	97	49-138	2	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 47.2	94	56-126	2	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 46.5	93	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 47.4	95	43-142	3	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 40.1	80	62-141	6	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 49.0	98	62-134	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2827

Sample Type: Post Spike Duplicate

Client ID: CALA-17-144880PSD

Matrix: W

Lab Sample ID 1203883756

Instrument: VOA6.I

Analysis Date: 09/27/2017 20:17

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	46.9	94	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	50.9	102	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	47.7	95	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4720	94	60-140	9	0-20

Volatile

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2827

Sample Type: Post Spike

Client ID: CALA-17-144880PS

Matrix: W

Lab Sample ID 1203883755

Instrument: VOA6.I

Analysis Date: 09/27/2017 20:45

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

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	238	95	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	269	108	57-149
107-05-1	PS Allyl chloride	250	0.00 U	241	96	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	249	100	59-129
107-12-0	PS Propionitrile	250	0.00 U	246	98	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	254	102	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	245	98	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	236	94	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2520	101	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	45.1	90	63-146

Volatile

Page 2 of 2

Quality Control Summary Spike Recovery Report

SDG Number: 2017-2827

Sample Type: Post Spike Duplicate

Client ID: CALA-17-144880PSD

Matrix: W

Lab Sample ID 1203883757

Instrument: VOA6.I

Analysis Date: 09/27/2017 21:13

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	Acceptance RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	236	94	49-141	1	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	272	109	57-149	1	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	243	97	54-128	1	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	253	101	59-129	2	0-20
107-12-0	PSD Propionitrile	250	0.00 U	248	99	58-131	1	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	255	102	59-134	1	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	248	99	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	241	96	60-136	2	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2550	102	60-143	1	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	45.7	91	63-146	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203884483

Instrument: VOA4.I

Analysis Date: 09/27/2017 11:58

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1704244

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	89.9	90	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1120	89	61-125
67-64-1	LCS Acetone	250	0.0	188	75	48-157
74-88-4	LCS Iodomethane	250	0.0	221	88	72-128
75-15-0	LCS Carbon disulfide	250	0.0	211	84	69-138
108-05-4	LCS Vinyl acetate	250	0.0	233	93	67-125
78-93-3	LCS 2-Butanone	250	0.0	206	82	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	220	88	66-124
591-78-6	LCS 2-Hexanone	250	0.0	203	81	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	46.5	93	40-160
74-87-3	LCS Chloromethane	50.0	0.0	49.5	99	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	50.2	100	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.8	100	63-137
75-00-3	LCS Chloroethane	50.0	0.0	46.0	92	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	47.0	94	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	47.5	95	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	42.0	84	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	43.7	87	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	44.8	90	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	44.4	89	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	43.7	87	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	46.1	92	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203884483

Instrument: VOA4.I

Analysis Date: 09/27/2017 11:58

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1704244

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	42.4	85	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	48.9	98	76-125
67-66-3	LCS Chloroform	50.0	0.0	45.0	90	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	44.2	88	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	42.0	84	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	44.8	90	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.8	90	74-122
71-43-2	LCS Benzene	50.0	0.0	43.7	87	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.1	90	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	43.5	87	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	46.2	92	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	44.0	88	78-131
108-88-3	LCS Toluene	50.0	0.0	43.8	88	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	45.7	91	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	47.6	95	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	45.1	90	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	45.1	90	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	47.6	95	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	49.4	99	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	44.9	90	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.1	88	73-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203884483

Instrument: VOA4.I

Analysis Date: 09/27/2017 11:58

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1704244

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.3	93	72-130
75-25-2	LCS Bromoform	50.0	0.0	45.0	90	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	42.4	85	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	46.4	93	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	48.4	97	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	45.2	90	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	41.5	83	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	43.5	87	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	44.5	89	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	42.6	85	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	45.0	90	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	43.6	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	43.8	88	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	45.0	90	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	43.8	88	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	42.4	85	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	46.5	93	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	44.1	88	72-136
91-20-3	LCS Naphthalene	50.0	0.0	48.7	97	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	46.9	94	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203884483

Instrument: VOA4.I

Analysis Date: 09/27/2017 11:58

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1704244

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	45.5	91	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	47.3	95	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	45.2	90	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5000	100	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-2827

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1704244

Matrix: WATER

Lab Sample ID 1203884484

Instrument: VOA4.I

Analysis Date: 09/27/2017 12:57

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1704244

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	225	90	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	237	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	212	85	59-125
107-13-1	LCS Acrylonitrile	250	0.0	236	94	65-122
107-12-0	LCS Propionitrile	250	0.0	226	90	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	227	91	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	236	94	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	230	92	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2210	88	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	38.6	77	66-147

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2827	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1704244	Instrument ID:	VOA6.I	Data File:	092717V6\6A306.D
Lab Sample ID:	1203883748	Prep Date:	09/27/2017 11:52	Analyzed:	09/27/17 11:52
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 1704244	1203883750	092717V6\6A303.D	09/27/17	1028
02 LCS for batch 1704244	1203883751	092717V6\6A305.D	09/27/17	1124
06 CAWA-17-142890	433059002	092717V6\6A313.D	09/27/17	1508
07 CAWA-17-143021	433059003	092717V6\6A314.D	09/27/17	1537
08 CAWA-17-142896	433059005	092717V6\6A315.D	09/27/17	1605
09 CAWA-17-143025	433059006	092717V6\6A316.D	09/27/17	1633
10 CAWA-17-143029	433059009	092717V6\6A317.D	09/27/17	1701
12 CALA-17-144880PS	1203883754	092717V6\6A323.D	09/27/17	1949
13 CALA-17-144880PSD	1203883756	092717V6\6A324.D	09/27/17	2017
14 CALA-17-144880PS	1203883755	092717V6\6A325.D	09/27/17	2045
15 CALA-17-144880PSD	1203883757	092717V6\6A326.D	09/27/17	2113

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2827	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1704244	Instrument ID:	VOA4.I	Data File:	092717V4\4B309BA.D
Lab Sample ID:	1203884482	Prep Date:	09/27/2017 13:26	Analyzed:	09/27/17 13:26
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
04 LCS for batch 1704244	1203884483	092717V4\4B306LA.D	09/27/17	1158
05 LCS for batch 1704244	1203884484	092717V4\4B308LA.D	09/27/17	1257
11 CAWA-17-142914	433059008	092717V4\4B318.D	09/27/17	1751

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203883748

Client Sample: QC for batch 1704244

Client ID: MB for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:52

Prep Date: 09/27/2017 11:52

Data File: 092717V6\6A306.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
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	J	0.470	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	J	0.420	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203883748

Client Sample: QC for batch 1704244

Client ID: MB for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:52

Prep Date: 09/27/2017 11:52

Data File: 092717V6\6A306.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	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	J	0.550	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

Page 3 of 3

SDG Number: 2017-2827

Lab Sample ID: 1203883748

Client Sample: QC for batch 1704244

Client ID: MB for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:52

Prep Date: 09/27/2017 11:52

Data File: 092717V6\6A306.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.6	50.0	ug/L 99	(71%-134%)
Bromofluorobenzene	49.8	50.0	ug/L 100	(70%-131%)
Toluene-d8	47.9	50.0	ug/L 96	(74%-124%)

Tentatively Identified Compound Summary

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 1203883750

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 10:28

Prep Date: 09/27/2017 10:28

Data File: 092717V6\6A303.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
630-20-6	1,1,1,2-Tetrachloroethane		53.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.5	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.1	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		51.4	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	52.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	B	53.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		51.4	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		44.8	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		50.8	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.3	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		51.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.5	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		49.9	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		53.4	ug/L	0.300	1.00
78-93-3	2-Butanone		267	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		50.4	ug/L	0.300	1.00
591-78-6	2-Hexanone		247	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		50.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		51.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		238	ug/L	1.50	5.00
67-64-1	Acetone		302	ug/L	1.50	10.0
75-05-8	Acetonitrile		1170	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		50.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.4	ug/L	0.300	1.00
74-97-5	Bromochloromethane		52.8	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.9	ug/L	0.300	1.00
75-25-2	Bromoform		48.0	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 1203883750

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 10:28

Prep Date: 09/27/2017 10:28

Data File: 092717V6\6A303.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		57.5	ug/L	0.300	1.00
75-15-0	Carbon disulfide		249	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.5	ug/L	0.300	1.00
75-00-3	Chloroethane		55.7	ug/L	0.300	1.00
67-66-3	Chloroform		52.6	ug/L	0.300	1.00
74-87-3	Chloromethane		57.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.8	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.1	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		73.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		50.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	53.9	ug/L	0.300	1.00
74-88-4	Iodomethane		248	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		50.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		52.0	ug/L	1.00	10.0
91-20-3	Naphthalene		52.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		49.7	ug/L	0.300	1.00
108-88-3	Toluene		48.8	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		58.1	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		266	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.4	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		100	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5260	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		52.1	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		50.4	ug/L	0.300	1.00
95-47-6	o-Xylene		49.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		51.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827

Lab Sample ID: 1203883750

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 10:28

Prep Date: 09/27/2017 10:28

Data File: 092717V6\6A303.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
1634-04-4	tert-Butyl methyl ether		50.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.6	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.3	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	50.6	50.0	101	(71%-134%)
Bromofluorobenzene	50.3	50.0	101	(70%-131%)
Toluene-d8	48.2	50.0	96	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2017-2827

Lab Sample ID: 1203883751

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:24

Prep Date: 09/27/2017 11:24

Data File: 092717V6\6A305.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
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		47.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		242	ug/L	1.50	5.00
107-13-1	Acrylonitrile		244	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203883751

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:24

Prep Date: 09/27/2017 11:24

Data File: 092717V6\6A305.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	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		239	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2500	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		248	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		246	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		243	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		275	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2827	Matrix:	WATER
Lab Sample ID:	1203883751		
Client Sample:	QC for batch 1704244	Client:	ARSL004
Client ID:	LCS for batch 1704244	Method:	SW-846:8260B
Batch ID:	1704244	Inst:	VOA6.I
Run Date:	09/27/2017 11:24	Analyst:	JP1
Prep Date:	09/27/2017 11:24	Purge Vol:	5 mL
Data File:	092717V6\6A305.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.6	50.0	101	(71%-134%)
Bromofluorobenzene	50.0	50.0	100	(70%-131%)
Toluene-d8	47.7	50.0	95	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883754	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 19:49	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 19:49		
Data File: 092717V6\6A323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		51.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.4	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		50.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		48.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.2	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	46.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	B	46.2	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		42.6	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.5	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.7	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		47.7	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.3	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.7	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		48.5	ug/L	0.300	1.00
78-93-3	2-Butanone		157	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		46.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		185	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		46.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		234	ug/L	1.50	5.00
67-64-1	Acetone		138	ug/L	1.50	10.0
75-05-8	Acetonitrile		1200	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		47.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		47.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.5	ug/L	0.300	1.00
75-25-2	Bromoform		45.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883754	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 19:49	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 19:49		
Data File: 092717V6\6A323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		59.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide		231	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		50.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.1	ug/L	0.300	1.00
75-00-3	Chloroethane		54.7	ug/L	0.300	1.00
67-66-3	Chloroform		50.9	ug/L	0.300	1.00
74-87-3	Chloromethane		54.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.8	ug/L	0.300	1.00
74-95-3	Dibromomethane		51.1	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		72.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	46.6	ug/L	0.300	1.00
74-88-4	Iodomethane		233	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.6	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.6	ug/L	1.00	10.0
91-20-3	Naphthalene		49.4	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		48.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.5	ug/L	0.300	1.00
108-88-3	Toluene		46.8	ug/L	0.300	1.00
79-01-6	Trichloroethylene		49.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		56.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		256	ug/L	1.50	5.00
75-01-4	Vinyl chloride		52.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		50.7	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		93.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5140	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.1	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		46.5	ug/L	0.300	1.00
95-47-6	o-Xylene		46.6	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.1	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883754	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 19:49	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 19:49				
Data File:	092717V6\6A323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		49.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		50.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		50.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	50.2	50.0	ug/L	100	(70%-131%)
Toluene-d8	49.0	50.0	ug/L	98	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883755	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 20:45	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 20:45				
Data File:	092717V6\6A325.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		45.1	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		238	ug/L	1.50	5.00
107-13-1	Acrylonitrile		249	ug/L	1.50	5.00
107-05-1	Allyl chloride		241	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883755	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 20:45	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 20:45		
Data File: 092717V6\6A325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		236	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2520	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		254	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		245	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		246	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		269	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883755	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 20:45	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 20:45				
Data File:	092717V6\6A325.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	50.9	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	50.1	50.0	ug/L	100	(70%-131%)
Toluene-d8	47.5	50.0	ug/L	95	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883756	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 20:17	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 20:17		
Data File: 092717V6\6A324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		50.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.1	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		48.4	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		50.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		49.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		48.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	47.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		48.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	B	46.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		40.1	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		50.5	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		49.7	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.7	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		47.2	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		49.3	ug/L	0.300	1.00
78-93-3	2-Butanone		146	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		170	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.3	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		218	ug/L	1.50	5.00
67-64-1	Acetone		129	ug/L	1.50	10.0
75-05-8	Acetonitrile		1120	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		48.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		47.6	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.6	ug/L	0.300	1.00
75-25-2	Bromoform		44.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883756	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 20:17	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 20:17		
Data File: 092717V6\6A324.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		61.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		239	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.6	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.6	ug/L	0.300	1.00
75-00-3	Chloroethane		55.4	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		57.2	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		49.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		72.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.6	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	48.9	ug/L	0.300	1.00
74-88-4	Iodomethane		238	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.7	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.3	ug/L	1.00	10.0
91-20-3	Naphthalene		49.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.9	ug/L	0.300	1.00
108-88-3	Toluene		47.3	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		57.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		245	ug/L	1.50	5.00
75-01-4	Vinyl chloride		55.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		50.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		50.5	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		95.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4720	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		47.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.5	ug/L	0.300	1.00
95-47-6	o-Xylene		47.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.4	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883756	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 20:17	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 20:17				
Data File:	092717V6\6A324.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		48.0	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		51.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		50.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.3	50.0	99	(71%-134%)
Bromofluorobenzene	48.9	50.0	98	(70%-131%)
Toluene-d8	48.1	50.0	96	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827	Date Collected: 09/20/2017 06:30	Matrix: W
Lab Sample ID: 1203883757	Date Received: 09/21/2017 09:00	
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: CALA-17-144880PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA6.I	Dilution: 1
Run Date: 09/27/2017 21:13	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 09/27/2017 21:13		
Data File: 092717V6\6A326.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		45.7	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		236	ug/L	1.50	5.00
107-13-1	Acrylonitrile		253	ug/L	1.50	5.00
107-05-1	Allyl chloride		243	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883757	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 21:13	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 21:13				
Data File:	092717V6\6A326.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		241	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2550	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		255	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		248	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		248	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		272	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Date Collected:	09/20/2017 06:30	Matrix:	W
Lab Sample ID:	1203883757	Date Received:	09/21/2017 09:00		
Client Sample:	QC for batch 1704244	Client:	ARSL004	Project:	QC
Client ID:	CALA-17-144880PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1704244	Inst:	VOA6.I	Dilution:	1
Run Date:	09/27/2017 21:13	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	09/27/2017 21:13				
Data File:	092717V6\6A326.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	50.0	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	49.5	50.0	ug/L	99	(70%-131%)
Toluene-d8	47.6	50.0	ug/L	95	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Matrix: WATER

Lab Sample ID: 1203884482

Client Sample: QC for batch 1704244

Client: ARSL004

Project: QC

Client ID: MB for batch 1704244

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA4.I

Dilution: 1

Run Date: 09/27/2017 13:26

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 09/27/2017 13:26

Data File: 092717V4\4B309BA.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203884482

Client Sample: QC for batch 1704244

Client ID: MB for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 13:26

Prep Date: 09/27/2017 13:26

Data File: 092717V4\4B309BA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2827	Matrix: WATER	
Lab Sample ID: 1203884482		
Client Sample: QC for batch 1704244	Client: ARSL004	Project: QC
Client ID: MB for batch 1704244	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1704244	Inst: VOA4.I	Dilution: 1
Run Date: 09/27/2017 13:26	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/27/2017 13:26		
Data File: 092717V4\4B309BA.D	Column: DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.7	50.0	ug/L 99	(71%-134%)
Bromofluorobenzene	46.4	50.0	ug/L 93	(70%-131%)
Toluene-d8	51.2	50.0	ug/L 102	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown hydrocarbon	4.27	18.9	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203884483

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:58

Prep Date: 09/27/2017 11:58

Data File: 092717V4\4B306LA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		47.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		44.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		46.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		47.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		43.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		42.0	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		42.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		46.9	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		48.4	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		45.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		43.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		46.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		49.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		45.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		43.5	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		43.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		45.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		45.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		43.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		42.4	ug/L	0.300	1.00
78-93-3	2-Butanone		206	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		44.5	ug/L	0.300	1.00
591-78-6	2-Hexanone		203	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		42.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		43.8	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		220	ug/L	1.50	5.00
67-64-1	Acetone		188	ug/L	1.50	10.0
75-05-8	Acetonitrile		1120	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		43.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		45.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		45.0	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827

Lab Sample ID: 1203884483

Client Sample: QC for batch 1704244

Client ID: LCS for batch 1704244

Batch ID: 1704244

Run Date: 09/27/2017 11:58

Prep Date: 09/27/2017 11:58

Data File: 092717V4\4B306LA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		49.8	ug/L	0.300	1.00
75-15-0	Carbon disulfide		211	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		44.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		44.9	ug/L	0.300	1.00
75-00-3	Chloroethane		46.0	ug/L	0.300	1.00
67-66-3	Chloroform		45.0	ug/L	0.300	1.00
74-87-3	Chloromethane		49.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		47.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		46.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		46.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		44.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		44.1	ug/L	0.300	1.00
74-88-4	Iodomethane		221	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		42.4	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		43.7	ug/L	1.00	10.0
91-20-3	Naphthalene		48.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		46.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.1	ug/L	0.300	1.00
108-88-3	Toluene		43.8	ug/L	0.300	1.00
79-01-6	Trichloroethylene		45.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		233	ug/L	1.50	5.00
75-01-4	Vinyl chloride		50.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		46.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		44.0	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		89.9	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5000	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		42.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		41.5	ug/L	0.300	1.00
95-47-6	o-Xylene		44.3	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**

Page 3 of 3

SDG Number:	2017-2827	Matrix:	WATER
Lab Sample ID:	1203884483		
Client Sample:	QC for batch 1704244	Client:	ARSL004
Client ID:	LCS for batch 1704244	Method:	SW-846:8260B
Batch ID:	1704244	Inst:	VOA4.I
Run Date:	09/27/2017 11:58	Analyst:	VXY1
Prep Date:	09/27/2017 11:58	Purge Vol:	5 mL
Data File:	092717V4\4B306LA.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		44.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		45.0	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		44.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		45.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.9	50.0	ug/L 100	(71%-134%)
Bromofluorobenzene	45.9	50.0	ug/L 92	(70%-131%)
Toluene-d8	51.3	50.0	ug/L 103	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2017-2827

Matrix: WATER

Lab Sample ID: 1203884484

Client Sample: QC for batch 1704244

Client: ARSL004

Project: QC

Client ID: LCS for batch 1704244

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1704244

Inst: VOA4.I

Dilution: 1

Run Date: 09/27/2017 12:57

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 09/27/2017 12:57

Data File: 092717V4\4B308LA.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		38.6	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		225	ug/L	1.50	5.00
107-13-1	Acrylonitrile		236	ug/L	1.50	5.00
107-05-1	Allyl chloride		212	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2827		Matrix:	WATER
Lab Sample ID: 1203884484			
Client Sample: QC for batch 1704244	Client: ARSL004	Project:	QC
Client ID: LCS for batch 1704244	Method: SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID: 1704244	Inst: VOA4.I	Dilution:	1
Run Date: 09/27/2017 12:57	Analyst: VXY1	Purge Vol:	5 mL
Prep Date: 09/27/2017 12:57			
Data File: 092717V4\4B308LA.D	Column: DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		230	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2210	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		227	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		236	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		226	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		237	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2827	Matrix:	WATER
Lab Sample ID:	1203884484		
Client Sample:	QC for batch 1704244	Client:	ARSL004
Client ID:	LCS for batch 1704244	Method:	SW-846:8260B
Batch ID:	1704244	Inst:	VOA4.I
Run Date:	09/27/2017 12:57	Analyst:	VXY1
Prep Date:	09/27/2017 12:57		
Data File:	092717V4\4B308LA.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.9	50.0	ug/L	100	(71%-134%)
Bromofluorobenzene	45.9	50.0	ug/L	92	(70%-131%)
Toluene-d8	51.1	50.0	ug/L	102	(74%-124%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2827
Work Order #: 433059**

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:	1702207
Prep Batch Number:	1702204

Sample Analysis

Sample ID	Client ID
433059001	433059001 (CAWA-17-142855)
433059004	433059004 (CAWA-17-142861)
433059007	433059007 (CAWA-17-142879)
1203878947	Interference Check Sample (ICS)
1203878943	Method Blank (MB)
1203878944	Laboratory Control Sample (LCS)
1203878945	432570001(CAWA-17-142856) Matrix Spike (MS)
1203878946	432570001(CAWA-17-142856) 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.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 432570001 (CAWA-17-142856) 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: 2017-2827 GEL Work Order: 433059

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 25 SEP 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142855Date Received: 19-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 433059001Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.0812	ug/L	J	1	20-SEP-17 21:56	per0920031a
	Perchlorate Isotope Ratio			2.89			1	20-SEP-17 21:56	per0920031a
14797-73-0	Perchlorate-101	.05	.2	0.0797	ug/L	J	1	20-SEP-17 21:56	per0920031a
	Perchlorate-O(18)			0.464	ug/L		1	20-SEP-17 21:56	per0920031a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142861Date Received: 19-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 433059004Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.536	ug/L		1	20-SEP-17 22:07	per0920032a
	Perchlorate Isotope Ratio			2.87			1	20-SEP-17 22:07	per0920032a
14797-73-0	Perchlorate-101	.05	.2	0.529	ug/L		1	20-SEP-17 22:07	per0920032a
	Perchlorate-O(18)			0.472	ug/L		1	20-SEP-17 22:07	per0920032a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142879Date Received: 19-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 433059007Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.268	ug/L		1	20-SEP-17 22:18	per0920033a
	Perchlorate Isotope Ratio			3.1			1	20-SEP-17 22:18	per0920033a
14797-73-0	Perchlorate-101	.05	.2	0.245	ug/L		1	20-SEP-17 22:18	per0920033a
	Perchlorate-O(18)			0.478	ug/L		1	20-SEP-17 22:18	per0920033a

^ 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): 2017-2827

Extract Batch Code: 1702204

Date Filtered: 20-SEP-17

Matrix: WATER

Sample ID: 1203878944

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.202	ug/L	101		85 - 115
Perchlorate Isotope Ratio		2.75				-
Perchlorate-101	0.200	.209	ug/L	104		85 - 115
Perchlorate-O(18)		.523	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): 2017-2827

Extract Batch Code: 1702204

Date Extracted: 20-SEP-17

GEL MS/PS ID: 1203878945

Client ID: CAWA-17-142856

GEL MSD/PSD ID: 1203878946

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	0.0173	ug/L	0.215	99	.222	103	4	30	75 - 125
Perchlorate Isotope Ratio	0	3.26		2.81		3.02		7		-
Perchlorate-101	0.200	0.0151	ug/L	0.217	101	.209	97	4	30	75 - 125
Perchlorate-O(18)	0	0.521	ug/L	0.516		.522		1		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 20-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 1203878943Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	20-SEP-17 18:39	per0920013a
	Perchlorate Isotope Ratio						1	20-SEP-17 18:39	per0920013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	20-SEP-17 18:39	per0920013a
	Perchlorate-O(18)			0.553	ug/L		1	20-SEP-17 18:39	per0920013a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 20-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 1203878944Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.202	ug/L		1	20-SEP-17 18:50	per0920014a
	Perchlorate Isotope Ratio			2.75			1	20-SEP-17 18:50	per0920014a
14797-73-0	Perchlorate-101	.05	.2	0.209	ug/L		1	20-SEP-17 18:50	per0920014a
	Perchlorate-O(18)			0.523	ug/L		1	20-SEP-17 18:50	per0920014a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-2827GEL Sample ID: 1203878947Date Filtered: 20-SEP-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.224	ug/L		1	20-SEP-17 19:01	per0920015a
	Perchlorate Isotope Ratio			2.65			1	20-SEP-17 19:01	per0920015a
14797-73-0	Perchlorate-101	.05	.2	0.240	ug/L		1	20-SEP-17 19:01	per0920015a
	Perchlorate-O(18)			0.522	ug/L		1	20-SEP-17 19:01	per0920015a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142856MSDate Received: 13-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 1203878945Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.215	ug/L		1	20-SEP-17 19:22	per0920017a
	Perchlorate Isotope Ratio			2.81			1	20-SEP-17 19:22	per0920017a
14797-73-0	Perchlorate-101	.05	.2	0.217	ug/L		1	20-SEP-17 19:22	per0920017a
	Perchlorate-O(18)			0.516	ug/L		1	20-SEP-17 19:22	per0920017a

^ 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: 1702204Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142856MSDDate Received: 13-SEP-17GEL Job No (SDG): 2017-2827GEL Sample ID: 1203878946Date Filtered: 20-SEP-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.222	ug/L		1	20-SEP-17 19:33	per0920018a
	Perchlorate Isotope Ratio			3.02			1	20-SEP-17 19:33	per0920018a
14797-73-0	Perchlorate-101	.05	.2	0.209	ug/L		1	20-SEP-17 19:33	per0920018a
	Perchlorate-O(18)			0.522	ug/L		1	20-SEP-17 19:33	per0920018a

^ 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 #: 2017-2827
Work Order #: 433059**

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: 1702490

Prep Batch Number: 1702489

Sample Analysis

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

Sample ID	Client ID
433059002	CAWA-17-142890
433059005	CAWA-17-142896
433059008	CAWA-17-142914
1203879543	Method Blank (MB)
1203879544	Laboratory Control Sample (LCS)
1203879545	433059002(CAWA-17-142890) Matrix Spike (MS)
1203879546	433059002(CAWA-17-142890) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

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

Calibration Blank Requirements

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

CRI Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 433059002 (CAWA-17-142890) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits for this analysis.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. Sample 433059005 (CAWA-17-142896) was further diluted due to over range target analytes. The final dilution in each case takes the 1:1 v/v dilution into account.

Analyte	433059
	005
RDX	10X

Sample Re-extraction/Re-analysis

Sample 433059008 (CAWA-17-142914) was re-analyzed to confirm potential carryover from the previous sample analysis. The re-analysis data are reported.

Miscellaneous Information**Manual Integrations**

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2827 GEL Work Order: 433059

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 26 SEP 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059002

Sample Amount 890 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919067.wiff

Date Analyzed: 21-SEP-17 20:14

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	.0899	U	0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
479-45-8	Tetryl	.0899	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	.0899	U	0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	.0899	U	0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0899	U	0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0899	U	0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.0899	U	0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0921	U	0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.112	U	0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.169	U	0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	.171	J	0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
80251-29-2	DNX	.254	J	0.0899	0.281
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	.337	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059002

Sample Amount 890 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	.337	U	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.337	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
5755-27-1	MNX	.412		0.0899	0.281
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.473		0.0899	0.281
<i>13980-04-6</i>	<i>TNX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.562	U	0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.562	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	1.72		0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	2.18		0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
121-82-4	RDX	6.89		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				
2691-41-0	HMX	6.91		0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142896

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059005

Sample Amount 930 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919092.wiff

Date Analyzed: 22-SEP-17 11:01

Dilution Factor: 10

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	27.5		0.430	1.34
121-82-4	RDX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142896

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059005

Sample Amount 930 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919093.wiff

Date Analyzed: 22-SEP-17 11:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.086	U	0.086	0.269
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.086	U	0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
479-45-8	Tetryl	.086	U	0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	.086	U	0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	.086	U	0.086	0.269
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.086	U	0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.086	U	0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.086	U	0.086	0.269
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0869	J	0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.0882	U	0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.108	U	0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
80251-29-2	DNX	.136	J	0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.16	J	0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142896

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059005

Sample Amount 930 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.161	U	0.161	0.538
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
13980-04-6	TNX	.207	J	0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.255	J	0.086	0.269
<i>5755-27-1</i>	<i>MNX</i>				
3058-38-6	TATB	.323	U	0.323	1.08
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.323	U	0.323	1.08
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.323	U	0.323	1.08
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.538	U	0.538	2.69
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.538	U	0.538	2.69
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	1.67		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142914

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059008

Sample Amount 900 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919091.wiff

Date Analyzed: 22-SEP-17 10:26

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0889	U	0.0889	0.278
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0889	U	0.0889	0.278
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
13980-04-6	TNX	.0889	U	0.0889	0.278
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0889	U	0.0889	0.278
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0889	U	0.0889	0.556
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.0889	U	0.0889	0.278
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.0889	U	0.0889	0.278
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.0889	U	0.0889	0.278
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.0889	U	0.0889	0.278
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0889	U	0.0889	0.278
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0889	U	0.0889	0.278
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.0889	U	0.0889	0.278
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142914

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 433059008

Sample Amount 900 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
88-72-2	o-Nitrotoluene	.0911	U	0.0911	0.278
88-72-2	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.111	U	0.111	0.556
78-11-5	<i>PETN</i>				
2691-41-0	HMX	.147	J	0.0889	0.278
2691-41-0	<i>HMX</i>				
99-99-0	p-Nitrotoluene	.167	U	0.167	0.556
99-99-0	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.333	U	0.333	1.11
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.333	U	0.333	1.11
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.333	U	0.333	1.11
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.556	U	0.556	2.78
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.556	U	0.556	2.78
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	1.07		0.0889	0.278
121-82-4	<i>RDX</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-2827**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
433059002	CAWA-17-142890	100	55 - 115	
433059005	CAWA-17-142896DL	97	55 - 115	
433059005	CAWA-17-142896	100	55 - 115	
433059008	CAWA-17-142914	93	55 - 115	
1203879543	MB for batch 1702489	96	55 - 115	
1203879544	LCS for batch 1702489	95	55 - 115	
1203879545	CAWA-17-142890MS	88	55 - 115	
1203879546	CAWA-17-142890MSD	102	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) 2017-2827

Extract Batch Code: 1702489

Date Extracted: 21-SEP-17

GEL LCS ID: 1203879544

GEL LCSDUP ID: .

Analysis Date/Time: 21-SEP-17 19:38

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
4-Amino-2,6-dinitrotoluene	5	4.44	89					74 - 116
DNX	.5	.425	85					65 - 113
HMX	5	3.65	73					58 - 113
MNX	.5	.426	85					66 - 114
Nitrobenzene	5	4.42	88					64 - 115
PETN	5	3.9	78					57 - 126
RDX	5	4.18	84					64 - 117
TATB	1.25	1.36	109					47 - 135
TNX	.5	.401	80					51 - 110
Tetryl	5	4.65	93					55 - 122
m-Dinitrobenzene	5	4.68	94					74 - 117
m-Nitrotoluene	5	4.11	82					66 - 114
o-Nitrotoluene	5	4.07	81					64 - 115
p-Nitrotoluene	5	4.32	86					66 - 127
tris(o-cresyl) phosphate	5	2.21	44					43 - 104
1,3,5-Trinitrobenzene	5	4.25	85					70 - 110
2,4,6-Trinitrotoluene	5	4.51	90					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.36	87					50 - 121
2,4-Dinitrotoluene	5	4.39	88					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.33	87					53 - 127
2,6-Dinitrotoluene	5	4.36	87					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.36	87					70 - 112
3,5-Dinitroaniline	5	4.09	82					70 - 121

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-142890

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Extract Batch Code: 1702489

Date Extracted: 21-SEP-17

GEL Spike ID: 1203879545

GEL SpikeDup ID: 1203879546

Analysis Date/Time: 21-SEP-17 20:49

MSD Analysis Date/Time: 21-SEP-17 21:25

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
Nitrobenzene	5.61798	0	4.52	80	4.73	86	4	30	62 - 116
PETN	5.61798	0	3.99	71	4.55	83	13	30	51 - 131
RDX	5.61798	6.89	11.1	76	12.3	98	10	30	57 - 125
TATB	1.40449	0	1.71	121	1.64	119	4	30	38 - 149
TNX	.5618	.473	.909	77	.874	73	4	30	46 - 120
Tetryl	5.61798	0	5.5	98	5.3	96	4	30	50 - 126
m-Dinitrobenzene	5.61798	0	5.51	98	5.52	100	0	30	74 - 117
m-Nitrotoluene	5.61798	0	4.24	75	4.48	82	6	30	59 - 120
o-Nitrotoluene	5.61798	0	3.93	70	5.03	92	25	30	56 - 119
p-Nitrotoluene	5.61798	0	4.54	81	4.81	88	6	30	61 - 129
tris(o-cresyl) phosphate	5.61798	0	2.65	47	2.9	53	9	30	38 - 105
1,3,5-Trinitrobenzene	5.61798	0	4.96	88	5.07	92	2	30	67 - 111
2,4,6-Trinitrotoluene	5.61798	.171	5.03	87	5.62	99	11	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.61798	0	4.32	77	3.3	60	27	30	50 - 121
2,4-Dinitrotoluene	5.61798	0	4.72	84	5.35	97	13	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.61798	0	4.04	72	4.31	78	6	30	53 - 127
2,6-Dinitrotoluene	5.61798	0	4.51	80	5.11	93	12	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.61798	1.72	6.11	78	6.95	95	13	30	67 - 115
3,5-Dinitroaniline	5.61798	.263	4.6	77	5.1	88	10	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.61798	2.18	6.84	83	7.52	97	9	30	65 - 120
DNX	.5618	.254	.736	86	.737	88	0	30	53 - 124
HMX	5.61798	6.91	11.2	76	12	93	7	30	44 - 128
MNX	.5618	.412	.879	83	.896	88	2	30	60 - 121

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1702489

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879543

Sample Amount 1000 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919065.wiff

Date Analyzed: 21-SEP-17 19:03

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1702489

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879543

Sample Amount 1000 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1702489

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879544

Sample Amount 1000 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919066.wiff

Date Analyzed: 21-SEP-17 19:38

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.401		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.425		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
5755-27-1	MNX	.426		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
3058-38-6	TATB	1.36		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	2.21		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
2691-41-0	HMX	3.65		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
78-11-5	PETN	3.9		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	4.07		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	4.09		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
99-08-1	m-Nitrotoluene	4.11		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
121-82-4	RDX	4.18		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
99-35-4	1,3,5-Trinitrobenzene	4.25		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.32		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1702489

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879544

Sample Amount 1000 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
59229-75-3	2,6-Diamino-4-nitrotoluene	4.33		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.36		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.36		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.36		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.39		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.42		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.44		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.51		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
479-45-8	Tetryl	4.65		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
99-65-0	m-Dinitrobenzene	4.68		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890(433059002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879545

Sample Amount 890 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919068.wiff

Date Analyzed: 21-SEP-17 20:49

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.736		0.0899	0.281
80251-29-2	DNX				
5755-27-1	MNX	.879		0.0899	0.281
5755-27-1	MNX				
13980-04-6	TNX	.909		0.0899	0.281
13980-04-6	TNX				
3058-38-6	TATB	1.71		0.337	1.12
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.65		0.337	1.12
78-30-8	tris(o-cresyl) phosphate				
88-72-2	o-Nitrotoluene	3.93		0.0921	0.281
88-72-2	o-Nitrotoluene				
78-11-5	PETN	3.99		0.112	0.562
78-11-5	PETN				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.04		0.562	2.81
59229-75-3	2,6-Diamino-4-nitrotoluene				
99-08-1	m-Nitrotoluene	4.24		0.0899	0.281
99-08-1	m-Nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.32		0.562	2.81
6629-29-4	2,4-Diamino-6-nitrotoluene				
606-20-2	2,6-Dinitrotoluene	4.51		0.0899	0.281
606-20-2	2,6-Dinitrotoluene				
98-95-3	Nitrobenzene	4.52		0.0899	0.281
98-95-3	Nitrobenzene				
99-99-0	p-Nitrotoluene	4.54		0.169	0.562
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890(433059002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879545

Sample Amount 890 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1 <i>618-87-1</i>	3,5-Dinitroaniline <i>3,5-Dinitroaniline</i>	4.6		0.337	1.12
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	4.72		0.0899	0.281
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	4.96		0.0899	0.281
118-96-7 <i>118-96-7</i>	2,4,6-Trinitrotoluene <i>2,4,6-Trinitrotoluene</i>	5.03		0.0899	0.281
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	5.5		0.0899	0.562
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	5.51		0.0899	0.281
35572-78-2 <i>35572-78-2</i>	2-Amino-4,6-dinitrotoluene <i>2-Amino-4,6-dinitrotoluene</i>	6.11		0.0899	0.281
19406-51-0 <i>19406-51-0</i>	4-Amino-2,6-dinitrotoluene <i>4-Amino-2,6-dinitrotoluene</i>	6.84		0.0899	0.281
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	11.1		0.0899	0.281
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	11.2		0.0899	0.281

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890(433059002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879546

Sample Amount 910 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919069.wiff

Date Analyzed: 21-SEP-17 21:25

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
80251-29-2	DNX	.737		0.0879	0.275
80251-29-2	DNX				
13980-04-6	TNX	.874		0.0879	0.275
13980-04-6	TNX				
5755-27-1	MNX	.896		0.0879	0.275
5755-27-1	MNX				
3058-38-6	TATB	1.64		0.330	1.10
3058-38-6	TATB				
78-30-8	tris(o-cresyl) phosphate	2.9		0.330	1.10
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.3		0.549	2.75
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.31		0.549	2.75
59229-75-3	2,6-Diamino-4-nitrotoluene				
99-08-1	m-Nitrotoluene	4.48		0.0879	0.275
99-08-1	m-Nitrotoluene				
78-11-5	PETN	4.55		0.110	0.549
78-11-5	PETN				
98-95-3	Nitrobenzene	4.73		0.0879	0.275
98-95-3	Nitrobenzene				
99-99-0	p-Nitrotoluene	4.81		0.165	0.549
99-99-0	p-Nitrotoluene				
88-72-2	o-Nitrotoluene	5.03		0.0901	0.275
88-72-2	o-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.07		0.0879	0.275
99-35-4	1,3,5-Trinitrobenzene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142890(433059002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2827

Matrix: WATER

GEL Sample ID: 1203879546

Sample Amount 910 mL

Date Received: 19-SEP-17

Moisture: .

Extraction Batch ID: 1702489

Extraction Type Sol Exchange

Date Extracted: 21-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
618-87-1	3,5-Dinitroaniline	5.1		0.330	1.10
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
606-20-2	2,6-Dinitrotoluene	5.11		0.0879	0.275
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
479-45-8	Tetryl	5.3		0.0879	0.549
<i>479-45-8</i>	<i>Tetryl</i>				
121-14-2	2,4-Dinitrotoluene	5.35		0.0879	0.275
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.52		0.0879	0.275
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.62		0.0879	0.275
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	6.95		0.0879	0.275
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	7.52		0.0879	0.275
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	12		0.0879	0.275
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	12.3		0.0879	0.275
<i>121-82-4</i>	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2827Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 19-SEP-17 22:05GEL Data File: EXP0919001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2827Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 19-SEP-17 22:40GEL Data File: EXP0919002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 20-SEP-17 03:24

GEL Data File: EXP0919010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 20-SEP-17 05:46

GEL Data File: EXP0919014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 20-SEP-17 11:05

GEL Data File: EXP0919023.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 20-SEP-17 12:16

GEL Data File: EXP0919025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 20-SEP-17 15:49

GEL Data File: EXP0919031.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	12.19
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 20-SEP-17 17:00

GEL Data File: EXP0919033.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 20-SEP-17 18:11

GEL Data File: EXP0919035.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 21-SEP-17 00:06

GEL Data File: EXP0919045.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 21-SEP-17 01:17

GEL Data File: EXP0919047.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 21-SEP-17 08:48

GEL Data File: EXP0919048.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 21-SEP-17 10:01

GEL Data File: EXP0919050.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 21-SEP-17 12:59

GEL Data File: EXP0919055.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK14

Analysis Date: 21-SEP-17 14:10

GEL Data File: EXP0919057.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
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	15.67
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
3,4-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK15

Analysis Date: 21-SEP-17 15:21

GEL Data File: EXP0919059.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MXN	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	11.62
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK16

Analysis Date: 21-SEP-17 16:32

GEL Data File: EXP0919061.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	40.04
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK17

Analysis Date: 21-SEP-17 17:52

GEL Data File: EXP0919063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK18

Analysis Date: 21-SEP-17 23:46

GEL Data File: EXP0919073.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK19

Analysis Date: 22-SEP-17 01:33

GEL Data File: EXP0919076.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK20

Analysis Date: 22-SEP-17 08:03

GEL Data File: EXP0919087.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK21

Analysis Date: 22-SEP-17 09:14

GEL Data File: EXP0919089.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK22

Analysis Date: 22-SEP-17 12:12

GEL Data File: EXP0919094.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2827

Lab Code: GEL

Lab Sample ID: XIBLK23

Analysis Date: 22-SEP-17 16:56

GEL Data File: EXP0919102.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2827
Work Order #: 433059

Sample ID	Client ID
433059001	CAWA-17-142855
433059002	CAWA-17-142890
433059004	CAWA-17-142861
433059005	CAWA-17-142896
433059007	CAWA-17-142879
433059008	CAWA-17-142914
1203878214	Method Blank (MB) ICP
1203878215	Laboratory Control Sample (LCS)
1203878218	433059001(CAWA-17-142855L) Serial Dilution (SD)
1203878216	433059001(CAWA-17-142855D) Sample Duplicate (DUP)
1203878217	433059001(CAWA-17-142855S) Matrix Spike (MS)
1203878199	Method Blank (MB) ICP-MS
1203878200	Laboratory Control Sample (LCS)
1203878203	433059001(CAWA-17-142855L) Serial Dilution (SD)
1203878201	433059001(CAWA-17-142855D) Sample Duplicate (DUP)
1203878202	433059001(CAWA-17-142855S) Matrix Spike (MS)
1203884541	Method Blank (MB) CVAA
1203884542	Laboratory Control Sample (LCS)
1203884547	433017001(NonSDGL) Serial Dilution (SD)
1203884543	433017001(NonSDGD) Sample Duplicate (DUP)
1203884545	433017001(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 433059001,002,004,005,007 and 008 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1701831, 1701824, 1704572 and 1709150
Prep Batch :	1701830, 1701822 and 1704569
Standard Operating Procedures:	GL-MA-E-013 REV# 29, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 31, GL-MA-E-010 REV# 35 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of calcium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 433059001 (CAWA-17-142855), 433059004 (CAWA-17-142861) and 433059007 (CAWA-17-142879)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 433059001

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: 2017-2827 GEL Work Order: 433059

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: 16 OCT 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059001**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142855**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:02	092917W1-4	1704572

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 433059001

BASIS: As Received

DATE COLLECTED 15-SEP-17

CLIENT ID: CAWA-17-142855

LEVEL: Low

DATE RECEIVED 19-SEP-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	331	ug/L		68	200	200	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-39-3	Barium	3730	ug/L		1	5	5	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-42-8	Boron	26.2	ug/L	J	15	50	50	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-70-2	Calcium	18400	ug/L		50	200	200	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	09/25/17 14:38	092517-1	1701831
7439-89-6	Iron	157	ug/L		30	100	100	1	P	HSC	09/25/17 14:38	092517-1	1701831
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7439-95-4	Magnesium	5080	ug/L		110	300	300	1	P	HSC	09/25/17 14:38	092517-1	1701831
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	09/25/17 14:38	092517-1	1701831
7439-98-7	Molybdenum	0.763	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/06/17 14:05	171006-3	1701824
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-09-7	Potassium	3350	ug/L		50	150	150	1	P	HSC	09/25/17 14:38	092517-1	1701831
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7631-86-9	Silica	44200	ug/L		53	213	213	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-23-5	Sodium	16600	ug/L		100	300	300	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-24-6	Strontium	168	ug/L		1	5	5	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-31-5	Tin	3.09	ug/L	J	2.5	10	10	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-61-1	Uranium	0.094	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	10/06/17 10:17	171005-2	1701824
7440-62-2	Vanadium	2.71	ug/L	J	1	5	5	1	P	HSC	09/25/17 14:38	092517-1	1701831
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	09/25/17 14:38	092517-1	1701831

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 433059001**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142855**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	67	mg/L		0.453	1.24	1.24	1		TXT1	10/12/17 12:20		1709150

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1701824	1701822	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1701831	1701830	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059002**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142890**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:04	092917W1-4	1704572

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059004**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142861**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:09	092917W1-4	1704572

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 433059004

BASIS: As Received

DATE COLLECTED 15-SEP-17

CLIENT ID: CAWA-17-142861

LEVEL: Low

DATE RECEIVED 19-SEP-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-39-3	Barium	17.3	ug/L		1	5	5	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-42-8	Boron	75.9	ug/L		15	50	50	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-70-2	Calcium	14700	ug/L		50	200	200	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-50-8	Copper	18.4	ug/L		3	10	10	1	P	HSC	09/25/17 14:32	092517-1	1701831
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	09/25/17 14:32	092517-1	1701831
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7439-95-4	Magnesium	6210	ug/L		110	300	300	1	P	HSC	09/25/17 14:32	092517-1	1701831
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	09/25/17 14:32	092517-1	1701831
7439-98-7	Molybdenum	0.567	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/06/17 14:11	171006-3	1701824
7440-02-0	Nickel	2.58	ug/L		0.6	2	2	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-09-7	Potassium	2270	ug/L		50	150	150	1	P	HSC	09/25/17 14:32	092517-1	1701831
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7631-86-9	Silica	58300	ug/L		53	213	213	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-23-5	Sodium	13300	ug/L		100	300	300	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-24-6	Strontium	110	ug/L		1	5	5	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-61-1	Uranium	0.383	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/06/17 10:26	171005-2	1701824
7440-62-2	Vanadium	2.96	ug/L	J	1	5	5	1	P	HSC	09/25/17 14:32	092517-1	1701831
7440-66-6	Zinc	40.6	ug/L		3.3	10	10	1	P	HSC	09/25/17 14:32	092517-1	1701831

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 433059004**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142861**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	62.4	mg/L		0.453	1.24	1.24	1		TXT1	10/12/17 12:20		1709150

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1701824	1701822	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1701831	1701830	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059005**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142896**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:10	092917W1-4	1704572

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059007**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142879**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:12	092917W1-4	1704572

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 433059007

BASIS: As Received

DATE COLLECTED 15-SEP-17

CLIENT ID: CAWA-17-142879

LEVEL: Low

DATE RECEIVED 19-SEP-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	1610	ug/L		68	200	200	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-38-2	Arsenic	2.06	ug/L	J	2	5	5	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-39-3	Barium	34.7	ug/L		1	5	5	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-42-8	Boron	21.9	ug/L	J	15	50	50	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-70-2	Calcium	10600	ug/L		50	200	200	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-47-3	Chromium	3.61	ug/L	J	3	10	10	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-50-8	Copper	19.3	ug/L		3	10	10	1	P	HSC	09/25/17 14:35	092517-1	1701831
7439-89-6	Iron	1100	ug/L		30	100	100	1	P	HSC	09/25/17 14:35	092517-1	1701831
7439-92-1	Lead	2.25	ug/L		0.5	2	2	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7439-95-4	Magnesium	3230	ug/L		110	300	300	1	P	HSC	09/25/17 14:35	092517-1	1701831
7439-96-5	Manganese	72.2	ug/L		2	10	10	1	P	HSC	09/25/17 14:35	092517-1	1701831
7439-98-7	Molybdenum	4.26	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/06/17 14:12	171006-3	1701824
7440-02-0	Nickel	5.36	ug/L		0.6	2	2	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-09-7	Potassium	3670	ug/L		50	150	150	1	P	HSC	09/25/17 14:35	092517-1	1701831
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7631-86-9	Silica	72900	ug/L		53	213	213	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-22-4	Silver	0.565	ug/L	J	0.3	1	1	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-23-5	Sodium	159000	ug/L		100	300	300	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-24-6	Strontium	69.4	ug/L		1	5	5	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-31-5	Tin	5.72	ug/L	J	2.5	10	10	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-61-1	Uranium	0.522	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/06/17 10:28	171005-2	1701824
7440-62-2	Vanadium	3.58	ug/L	J	1	5	5	1	P	HSC	09/25/17 14:35	092517-1	1701831
7440-66-6	Zinc	124	ug/L		3.3	10	10	1	P	HSC	09/25/17 14:35	092517-1	1701831

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 433059007**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142879**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	39.7	mg/L		0.453	1.24	1.24	1		TXT1	10/12/17 12:20		1709150

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1701824	1701822	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1701831	1701830	SW846 3005A	50	mL	50	mL	09/19/17	JXM8
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2827**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 433059008**BASIS:** As Received**DATE COLLECTED** 15-SEP-17**CLIENT ID:** CAWA-17-142914**LEVEL:** Low**DATE RECEIVED** 19-SEP-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	09/29/17 11:14	092917W1-4	1704572

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1704572	1704569	EPA 245.1/245.2 Prep	20	mL	20	mL	09/28/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2827

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>
1203878199	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
1203878214	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Calcium	50	ug/L	+/-200	U	P	50	200
	Copper	3	ug/L	+/-10	U	P	3	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Sodium	146	ug/L	+/-300	J	P	100	300
	Silica	53	ug/L	+/-213	U	P	53	213
	Potassium	50	ug/L	+/-150	U	P	50	150
	Manganese	2	ug/L	+/-10	U	P	2	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Barium	1	ug/L	+/-5	U	P	1	5
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203884541	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. 2017-2827 Client ID CAWA-17-142855S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 433059001 Spike ID: 1203878202

<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	49.5		1	U	50	98.4		MS
Arsenic	ug/L	75-125	52.6		2	U	50	103		MS
Cadmium	ug/L	75-125	52.9		0.3	U	50	106		MS
Chromium	ug/L	75-125	52		3	U	50	103		MS
Lead	ug/L	75-125	51.4		0.5	U	50	103		MS
Molybdenum	ug/L	75-125	55.8		0.763		50	110		MS
Nickel	ug/L	75-125	53.3		0.6	U	50	106		MS
Selenium	ug/L	75-125	51.9		2	U	50	103		MS
Silver	ug/L	75-125	51.6		0.3	U	50	103		MS
Thallium	ug/L	75-125	48.6		0.6	U	50	97.2		MS
Uranium	ug/L	75-125	52.2		0.094	J	50	104		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2827 Client ID: CAWA-17-142855S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 433059001 Spike ID: 1203878217

<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	5240		331		5000	98.2		P
Barium	ug/L		4070		3730		500	67.7	N/A	P
Beryllium	ug/L	75-125	498		1	U	500	99.6		P
Boron	ug/L	75-125	546		26.2	J	500	104		P
Calcium	ug/L	75-125	22900		18400		5000	89		P
Cobalt	ug/L	75-125	499		1	U	500	99.7		P
Copper	ug/L	75-125	516		3	U	500	103		P
Iron	ug/L	75-125	5660		157		5000	110		P
Magnesium	ug/L	75-125	10100		5080		5000	101		P
Manganese	ug/L	75-125	493		2	U	500	98.3		P
Potassium	ug/L	75-125	7880		3350		5000	90.6		P
Silica	ug/L		53000		44200		10700	81.6	N/A	P
Sodium	ug/L	75-125	22400		16600		5000	115		P
Strontium	ug/L	75-125	704		168		500	107		P
Tin	ug/L	75-125	492		3.09	J	500	97.8		P
Vanadium	ug/L	75-125	507		2.71	J	500	101		P
Zinc	ug/L	75-125	474		3.3	U	500	94.4		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2827 **Client ID:** WT_SEP_URB-17-145671S**Contract:** ESHL00114 **Level:** Low**Matrix:** STORM WATER **% Solids:****Sample ID:** 433017001 **Spike ID:** 1203884545

<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	2.2		0.067	U	2	108		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2017-2827

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142855D

Matrix: WATER

Level: Low

Sample ID: 433059001

Duplicate ID: 1203878201

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.763		0.828		8.17		MS
Nickel	ug/L		0.6 U		0.6 U				MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.094 J		0.096 J		2.11		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017-2827

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142855D

Matrix: WATER

Level: Low

Sample ID: 433059001

Duplicate ID: 1203878216

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	331		300		9.83		P
Barium	ug/L	+/-20%	3730		3640		2.57		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	26.2 J		25.2 J		3.8		P
Calcium	ug/L	+/-20%	18400		18000		2.42		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	157		146		6.85		P
Magnesium	ug/L	+/-20%	5080		4960		2.39		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	3350		3290		1.82		P
Silica	ug/L	+/-20%	44200		43200		2.51		P
Sodium	ug/L	+/-20%	16600		16300		1.89		P
Strontium	ug/L	+/-20%	168		166		.905		P
Tin	ug/L	+/-10	3.09 J		3.12 J		.872		P
Vanadium	ug/L	+/-5	2.71 J		2.4 J		12		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2017–2827**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_SEP_URB–17–145671D**Matrix:** STORM WATER**Level:** Low**Sample ID:** 433017001**Duplicate ID:** 1203884543**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. 2017-2827

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>
1203878200								
	Antimony	ug/L	50	48.7		97.4	80-120	MS
	Arsenic	ug/L	50	51.1		102	80-120	MS
	Cadmium	ug/L	50	53.1		106	80-120	MS
	Chromium	ug/L	50	53.2		106	80-120	MS
	Lead	ug/L	50	52.2		104	80-120	MS
	Molybdenum	ug/L	50	51		102	80-120	MS
	Nickel	ug/L	50	53.9		108	80-120	MS
	Selenium	ug/L	50	52		104	80-120	MS
	Silver	ug/L	50	52.5		105	80-120	MS
	Thallium	ug/L	50	49.7		99.3	80-120	MS
	Uranium	ug/L	50	50.6		101	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2827

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>
1203878215								
	Aluminum	ug/L	5000	4930		98.6	80-120	P
	Barium	ug/L	500	483		96.6	80-120	P
	Beryllium	ug/L	500	480		95.9	80-120	P
	Boron	ug/L	500	496		99.1	80-120	P
	Calcium	ug/L	5000	4950		99	80-120	P
	Cobalt	ug/L	500	496		99.1	80-120	P
	Copper	ug/L	500	495		99	80-120	P
	Iron	ug/L	5000	5280		106	80-120	P
	Magnesium	ug/L	5000	5110		102	80-120	P
	Manganese	ug/L	500	488		97.7	80-120	P
	Potassium	ug/L	5000	4700		94	80-120	P
	Silica	ug/L	10700	9880		92.3	80-120	P
	Sodium	ug/L	5000	5230		105	80-120	P
	Strontium	ug/L	500	512		102	80-120	P
	Tin	ug/L	500	477		95.5	80-120	P
	Vanadium	ug/L	500	486		97.3	80-120	P
	Zinc	ug/L	500	464		92.8	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2827

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>
1203884542	Mercury	ug/L	2	2.16		108	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2827

Client ID: CAWA-17-142855L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 433059001

Serial Dilution ID: 1203878203

<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	.763		1	U	.262			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	.094	J	.335	U	48.936			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2827

Client ID: CAWA-17-142855L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 433059001

Serial Dilution ID: 1203878218

<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	331		384	J	16.167			P
Barium	3730		3690		1.167		10	P
Beryllium	1	U	5	U				P
Boron	26.2	J	75	U	27			P
Calcium	18400		18200		1.212		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	157		190	J	21.491			P
Magnesium	5080		5020		1.213			P
Manganese	2	U	10	U				P
Potassium	3350		3250		3.208		10	P
Silica	44200		42600		3.616		10	P
Sodium	16600		16500		.869		10	P
Strontium	168		167		.537		10	P
Tin	3.09	J	12.5	U	33.991			P
Vanadium	2.71	J	5	U	23.933			P
Zinc	3.3	U	23.1	J				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2827 **Client ID:** WT_SEP_URB-17-145671L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 433017001 **Serial Dilution ID:** 1203884547

<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 #: 2017-2827
Work Order #: 433059**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1701620

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
433059002	CAWA-17-142890
433059005	CAWA-17-142896
433059008	CAWA-17-142914
1203877657	Method Blank (MB)
1203877658	Laboratory Control Sample (LCS)
1203877660	433017001(NonSDG) Sample Duplicate (DUP)
1203877663	433017001(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-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 433017001 (NonSDG) 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 following sample 433059008 (CAWA-17-142914) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	433059
	008
Total Organic Carbon Average	50X

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1701309	Method:	WSP-CN(T)
Prep Batch :	1701308	Method:	EPA 335.4

Sample Analysis

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

Sample ID	Client ID
433059002	CAWA-17-142890
433059005	CAWA-17-142896
433059008	CAWA-17-142914
1203876739	Method Blank (MB)
1203876740	Laboratory Control Sample (LCS)
1203876741	433014001(WST16-17-147285) Sample Duplicate (DUP)
1203876745	433014001(WST16-17-147285) 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

Sample 433014001 (WST16-17-147285) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1703592

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203882341	Method Blank (MB)
1203882342	Laboratory Control Sample (LCS)
1203882343	433013004(CAWA-17-142868) Sample Duplicate (DUP)
1203882344	433013004(CAWA-17-142868) 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-3000 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 433013004 (CAWA-17-142868) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following sample 433059001 (CAWA-17-142855) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	433059
	001
Chloride	2X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203882343 (CAWA-17-142868DUP), 433059001 (CAWA-17-142855), 433059004 (CAWA-17-142861) and 433059007 (CAWA-17-142879) 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:	1702222	Method:	NH3
Prep Batch :	1702221	Method:	EPA 350.1 Prep

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203878976	Method Blank (MB)
1203878977	Laboratory Control Sample (LCS)
1203878978	433059001(CAWA-17-142855) Sample Duplicate (DUP)
1203878979	433059001(CAWA-17-142855) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 433059001 (CAWA-17-142855) 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 Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Nitrogen, Ammonia	1203878978 (CAWA-17-142855DUP)	abs(.0372 - .0981)* (+/- .05 mg/L)

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 1203878978 (CAWA-17-142855DUP), 1203878979 (CAWA-17-142855MS), 433059004 (CAWA-17-142861) and 433059007 (CAWA-17-142879) were re-analyzed due to CCV failure. The reanalysis data

with passing instrument QC was 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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1701316	Method:	TKN
Prep Batch :	1701315	Method:	EPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
433059002	CAWA-17-142890
433059005	CAWA-17-142896
433059008	CAWA-17-142914
1203876776	Method Blank (MB)
1203876777	Laboratory Control Sample (LCS)
1203876778	433160004(WST05-17-145280) Sample Duplicate (DUP)
1203876780	433160004(WST05-17-145280) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 433160004 (WST05-17-145280) was selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203876780 (WST05-17-145280MS)	112* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1703447

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203881947	Method Blank (MB)
1203881948	Laboratory Control Sample (LCS)
1203881949	433059001(CAWA-17-142855) Sample Duplicate (DUP)
1203881950	433059001(CAWA-17-142855) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 9.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 433059001 (CAWA-17-142855) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1701314	Method:	PO4
Prep Batch :	1701313	Method:	EPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203876768	Method Blank (MB)
1203876769	Laboratory Control Sample (LCS)
1203876770	432723001(CAWA-17-142865) Sample Duplicate (DUP)
1203876773	432723001(CAWA-17-142865) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432723001 (CAWA-17-142865) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1702695

Method: TDS

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203879994	Method Blank (MB)
1203879995	Laboratory Control Sample (LCS)
1203879996	433059007(CAWA-17-142879) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 433059007 (CAWA-17-142879) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1705527

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203886675	Laboratory Control Sample (LCS)
1203886676	432594001(CAWA-17-142887) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Calibration Verification Information

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

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432594001 (CAWA-17-142887) 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: 1701903 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203878363	Laboratory Control Sample (LCS)
1203878364	432570001(CAWA-17-142856) Sample Duplicate (DUP)
1203878365	433059007(CAWA-17-142879) 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

Samples 432570001 (CAWA-17-142856) and 433059007 (CAWA-17-142879) 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

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

Sample	Analyte	Value
1203878364 (CAWA-17-142856DUP)	pH	Received 13-SEP-17, out of holding 07-SEP-17
1203878365 (CAWA-17-142879DUP)	pH	Received 19-SEP-17, out of holding 15-SEP-17
433059001 (CAWA-17-142855)	pH	Received 19-SEP-17, out of holding 15-SEP-17
433059004 (CAWA-17-142861)	pH	Received 19-SEP-17, out of holding 15-SEP-17
433059007 (CAWA-17-142879)	pH	Received 19-SEP-17, out of holding 15-SEP-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: 1701895 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
433059001	CAWA-17-142855
433059004	CAWA-17-142861
433059007	CAWA-17-142879
1203878342	Laboratory Control Sample (LCS)
1203878344	433059007(CAWA-17-142879) Sample Duplicate (DUP)
1203878354	433059007(CAWA-17-142879) 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 433059007 (CAWA-17-142879) 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

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Qualifier Definition Report for

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

Client SDG: 2017-2827 GEL Work Order: 433059


The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 12 OCT 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142855
Sample ID: 433059001
Matrix: W
Collect Date: 15-SEP-17 09:37
Receive Date: 19-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	09/25/17	2236	1703592	1
Fluoride		0.116	0.033	0.100	mg/L		1					
Sulfate		6.24	0.133	0.400	mg/L		1					
Chloride		14.6	0.134	0.400	mg/L		2	MXL2	09/26/17	1434	1703592	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0981	0.017	0.050	mg/L	1.00	1	KLP1	09/25/17	1032	1702222	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.091	0.017	0.050	mg/L		1	AXH3	09/25/17	1307	1703447	4
PO4 "As Received"												
Phosphorus, Total as P		0.063	0.020	0.050	mg/L	1.00	1	KLP1	09/21/17	1458	1701314	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		159	3.40	14.3	mg/L			KLP1	09/21/17	1245	1702695	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		75.4	1.45	4.00	mg/L			RXB5	09/19/17	1459	1701895	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		222	1.00	1.00	umhos/cm		1	VH1	10/03/17	1245	1705527	8
PH "As Received"												
pH at Temp 17.9C	H	6.97	0.010	0.100	SU		1	RXB5	09/19/17	1454	1701903	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/25/17	0859	1702221
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	09/21/17	1300	1701313

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142855
Sample ID: 433059001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 12, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2017-2827

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-142890

Project: ESHL00114

Sample ID: 433059002

Client ID: ARSL004

Matrix: W

Collect Date: 15-SEP-17 09:39

Receive Date: 19-SEP-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.13	0.330	1.00	mg/L		1	TSM	09/22/17	0709	1701620	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/20/17	0931	1701309	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.174	0.033	0.100	mg/L	1.00	1	KLP1	09/21/17	1659	1701316	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/20/17	0737	1701308
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	09/21/17	1300	1701315

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142861
Sample ID: 433059004
Matrix: W
Collect Date: 15-SEP-17 12:42
Receive Date: 19-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0811	0.067	0.200	mg/L		1	MXL2	09/25/17	2306	1703592	1
Chloride		8.04	0.067	0.200	mg/L		1					
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate		9.77	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0298	0.017	0.050	mg/L	1.00	1	KLP1	09/25/17	1526	1702222	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.04	0.017	0.050	mg/L		1	AXH3	09/25/17	1311	1703447	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0228	0.020	0.050	mg/L	1.00	1	KLP1	09/21/17	1459	1701314	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		167	3.40	14.3	mg/L			KLP1	09/21/17	1245	1702695	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		65.5	1.45	4.00	mg/L			RXB5	09/19/17	1502	1701895	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		389	1.00	1.00	umhos/cm		1	VH1	10/03/17	1245	1705527	7
PH "As Received"												
pH at Temp 17.6C	H	7.06	0.010	0.100	SU		1	RXB5	09/19/17	1500	1701903	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/25/17	0859	1702221
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	09/21/17	1300	1701313

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142861
Sample ID: 433059004

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142896
Sample ID: 433059005
Matrix: W
Collect Date: 15-SEP-17 12:42
Receive Date: 19-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		1.11	0.330	1.00	mg/L		1	TSM	09/22/17	0756	1701620	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/20/17	0932	1701309	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	J	0.0396	0.033	0.100	mg/L	1.00	1	KLP1	09/21/17	1700	1701316	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/20/17	0737	1701308
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	09/21/17	1300	1701315

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142879
Sample ID: 433059007
Matrix: W
Collect Date: 15-SEP-17 12:15
Receive Date: 19-SEP-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	09/25/17	2335	1703592	1
Chloride		3.43	0.067	0.200	mg/L		1					
Fluoride	J	0.0736	0.033	0.100	mg/L		1					
Sulfate		19.6	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0496	0.017	0.050	mg/L	1.00	1	KLP1	09/25/17	1527	1702222	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.170	0.017	0.050	mg/L		1	AXH3	09/25/17	1312	1703447	3
PO4 "As Received"												
Phosphorus, Total as P		0.076	0.020	0.050	mg/L	1.00	1	KLP1	09/21/17	1500	1701314	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		1120	3.40	14.3	mg/L			KLP1	09/21/17	1245	1702695	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		77.0	1.45	4.00	mg/L			RXB5	09/19/17	1504	1701895	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		730	1.00	1.00	umhos/cm		1	VH1	10/03/17	1246	1705527	7
PH "As Received"												
pH at Temp 18.1C	H	7.14	0.010	0.100	SU		1	RXB5	09/19/17	1502	1701903	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/25/17	0859	1702221
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	09/21/17	1300	1701313

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142879
Sample ID: 433059007

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 12, 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: 2017-2827

Client Sample ID: CAWA-17-142914
Sample ID: 433059008
Matrix: W
Collect Date: 15-SEP-17 12:15
Receive Date: 19-SEP-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		377	16.5	50.0	mg/L		50	TSM	09/26/17	1112	1701620	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/20/17	0933	1701309	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.291	0.033	0.100	mg/L	1.00	1	KLP1	09/21/17	1706	1701316	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/20/17	0737	1701308
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	09/21/17	1300	1701315

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: October 12, 2017

Page 1 of 6

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

Contact: Ms. Nita Patel

Workorder: 433059

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

Carbon Analysis

Batch	1701620										
-------	---------	--	--	--	--	--	--	--	--	--	--

QC1203877660	433017001	DUP									
Total Organic Carbon Average		11.4		11.6	mg/L	1.25		(0%-20%)	TSM	09/22/17	06:22

QC1203877658	LCS										
Total Organic Carbon Average	10.0			10.0	mg/L		100	(80%-120%)		09/21/17	16:29

QC1203877657	MB										
Total Organic Carbon Average			U	ND	mg/L					09/21/17	16:17

QC1203877663	433017001	PS									
Total Organic Carbon Average	10.0	11.4		21.7	mg/L		103	(75%-125%)		09/22/17	06:45

Flow Injection Analysis

Batch	1701309										
-------	---------	--	--	--	--	--	--	--	--	--	--

QC1203876741	433014001	DUP									
Cyanide, Total		6.18		7.43	ug/L	18.4	^	(+/-5.00)	AXH3	09/20/17	09:28

QC1203876740	LCS										
Cyanide, Total	50.0			48.4	ug/L		96.8	(90%-110%)		09/20/17	09:10

QC1203876739	MB										
Cyanide, Total			U	ND	ug/L					09/20/17	09:04

QC1203876745	433014001	MS									
Cyanide, Total	100	6.18		102	ug/L		95.8	(90%-110%)		09/20/17	09:29

Ion Chromatography

Batch	1703592										
-------	---------	--	--	--	--	--	--	--	--	--	--

QC1203882343	433013004	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	09/25/17	21:08

GEL LABORATORIES LLC

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QC Summary

Workorder: 433059

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1703592										
Chloride		1.51		1.51	mg/L	0.563		(0%-20%)	MXL2	09/25/17	21:08
Fluoride	J	0.0384	J	0.0359	mg/L	6.73	^	(+/-0.100)			
Sulfate		2.27		2.24	mg/L	1.7		(0%-20%)			
QC1203882342 LCS											
Bromide	1.25			1.27	mg/L		101	(80%-120%)		09/25/17	20:09
Chloride	5.00			4.61	mg/L		92.2	(80%-120%)			
Fluoride	2.50			2.29	mg/L		91.4	(80%-120%)			
Sulfate	10.0			9.62	mg/L		96.2	(80%-120%)			
QC1203882341 MB											
Bromide			U	ND	mg/L					09/25/17	19:40
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203882344 433013004 PS											
Bromide	1.25	U	ND	1.25	mg/L		96.7	(75%-125%)		09/25/17	21:38
Chloride	5.00		1.51	6.35	mg/L		96.8	(75%-125%)			
Fluoride	2.50	J	0.0384	2.40	mg/L		94.4	(75%-125%)			
Sulfate	10.0		2.27	12.3	mg/L		100	(75%-125%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1701314										
QC1203876770	432723001	DUP									
Phosphorus, Total as P		0.256		0.254	mg/L	0.784		(0%-27%)	KLP1	09/21/17	14:27
QC1203876769	LCS										
Phosphorus, Total as P	1.00			1.08	mg/L		108	(80%-124%)		09/21/17	14:25
QC1203876768	MB										
Phosphorus, Total as P			U	ND	mg/L					09/21/17	14:24
QC1203876773	432723001	MS									
Phosphorus, Total as P	1.00	0.256		1.38	mg/L		112	(63%-139%)		09/21/17	14:32
Batch	1701316										
QC1203876778	433160004	DUP									
Nitrogen, Total Kjeldahl		0.707		0.790	mg/L	11.1		(0%-20%)	KLP1	09/21/17	17:07
QC1203876777	LCS										
Nitrogen, Total Kjeldahl	1.00			1.08	mg/L		108	(90%-110%)		09/21/17	16:34
QC1203876776	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					09/21/17	16:33
QC1203876780	433160004	MS									
Nitrogen, Total Kjeldahl	1.00	0.707		1.83	mg/L		112 *	(90%-110%)		09/21/17	17:08
Batch	1702222										
QC1203878978	433059001	DUP									
Nitrogen, Ammonia		0.0981	J	0.0372	mg/L	90 * ^		(+/-0.050)	KLP1	09/25/17	15:25
QC1203878977	LCS										
Nitrogen, Ammonia	1.00			1.07	mg/L		107	(90%-110%)		09/25/17	10:31
QC1203878976	MB										
Nitrogen, Ammonia			U	ND	mg/L					09/25/17	10:31

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1702222										
QC1203878979	433059001	MS									
Nitrogen, Ammonia	1.00	0.0981		1.06	mg/L		96.2	(90%-110%)	KLP1	09/25/17	15:26
Batch	1703447										
QC1203881949	433059001	DUP									
Nitrogen, Nitrate/Nitrite		0.091		0.0916	mg/L	0.657	^	(+/-0.050)	AXH3	09/25/17	13:08
QC1203881948	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.09	mg/L		109	(90%-110%)		09/25/17	13:01
QC1203881947	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					09/25/17	13:00
QC1203881950	433059001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.091		1.18	mg/L		109	(90%-110%)		09/25/17	13:10
Solids Analysis											
Batch	1702695										
QC1203879996	433059007	DUP									
Total Dissolved Solids		1120		1160	mg/L	3.65		(0%-5%)	KLP1	09/21/17	12:45
QC1203879995	LCS										
Total Dissolved Solids	300			290	mg/L		96.7	(95%-105%)		09/21/17	12:45
QC1203879994	MB										
Total Dissolved Solids			U	ND	mg/L					09/21/17	12:45
Titration and Ion Analysis											
Batch	1701895										
QC1203878344	433059007	DUP									
Alkalinity, Total as CaCO3		77.0		76.2	mg/L	1.04		(0%-20%)	RXB5	09/19/17	15:12
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1701895										
QC1203878342	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)	RXB5	09/19/17	14:16
QC1203878354	433059007	MS									
Alkalinity, Total as CaCO3	100	77.0		180	mg/L		103	(80%-120%)		09/19/17	15:12
Batch	1701903										
QC1203878364	432570001	DUP									
pH		H	8.30	H	8.31	SU	0.12	(0%-5%)	RXB5	09/19/17	14:27
QC1203878365	433059007	DUP									
pH		H	7.14	H	7.19	SU	0.698	(0%-5%)		09/19/17	15:09
QC1203878363	LCS										
pH	7.00			6.98	SU		99.7	(99%-101%)		09/19/17	13:55
Batch	1705527										
QC1203886676	432594001	DUP									
Conductivity		209		210	umhos/cm	0.477		(0%-10%)	VH1	10/03/17	12:40
QC1203886675	LCS										
Conductivity	1410			1410	umhos/cm		99.6	(95%-105%)		10/03/17	12:30

- 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

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

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

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

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

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

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