

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

Chain of Custody/Analysis Request

COC/Lab Request #:

2017-2776

Page 1 of 1

Client Contact:

Lab Agreement #:

Site Name:

Los Alamos National Laboratory

Project Number:

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐7 Days - ☐14 Days - ☐21 Days - ☐28 Days - ☒

Rad Screening Info:

~~Yes~~ Below
BackgroundLoc-
No

Lab Reporting Limit Type:

~~Sample Quantitation~~
Limit

MDL

Field Sample ID

Sample
DateSample
TimeSample
Matrix

MSGP-Hg

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8330B-NMED HEXMOD

WSP-All Metals

WSP-CN(T)

WSP-GENINORG+PerChlorate

WSP-NH3+NO3/NO2+PO4

WSP-TKN+TOC

CAWA-17-142883

Sep 13 2017

10:44

W

1

1

1

CAWA-17-142918

Sep 13 2017

10:44

W

1

2

2

3

1

1

CAWA-17-143033

Sep 13 2017

10:44

W

X

Special Instructions:

Relinquished by:

Sherrwood

Print Name: Sherrwood

Date/Time: 9/14/2017

Received by:

Date/Time:

Print Name:

Date/Time:

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-17-142883

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09-13-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:44		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-47		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	1		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	1		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
1	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE	1	1
1	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	1	1

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

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

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 9/13/17 12:10	RECEIVED BY <i>M. Shendo</i> (Printed Name) <i>M. Shendo</i> (Signature) <i>M. Shendo</i>	Date/Time 9/13/17 12:10
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-17-142918

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09-13-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:44		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-47		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	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

Sampled $\pm 50'$ ft from running diesel generator & $\pm 35'$ from running diesel fuel truck.

LOCATION COMMENTS:

Calm wind during time of sample collection.

FIELD PARAMETERS:

Sample Time	10:44	HH:MM	Dissolved Oxygen	6.33 mg/L	Flow (in gpm)	3.90 gpm
Oxidation-Reduction Potential	-219.9 mV		pH	6.70 SU	Specific Conductance	108.2 μ S/cm
Temperature	14.6 $^{\circ}$ C		Turbidity	1.04 NTU		

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

Date/Time

Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11390**EVENT NAME:** Water/CdV (TA16 260) Q4 MY2017**SAMPLE ID:** CAWA-17-142918**WORK ORDER:**

RELINQUISHED BY (Printed Name) <i>Munira Shendo</i> (Signature) <i>Munira Shendo</i>	<i>9/13/17</i> <i>12:10</i>	RECEIVED BY (Printed Name) <i>S. Sherwood</i> (Signature) <i>S. Sherwood</i>	<i>9/13/17</i> <i>12:10</i>
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-17-143033

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09-13-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:44		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-47		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	HCL	Y	NA

SAMPLE COMMENTS:

09-13-2017

LOCATION COMMENTS:

FIELD PARAMETERS:

NA
09-13-2017

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

COLLECTED BY (PRINT):

K. Tow, M. Shendo

RELINQUISHED BY (Printed Name) Maurice Shendo (Signature) <i>Maurice Shendo</i>	Date/Time 9/13/17 1210	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 9/13/17 1210
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

coc: 2017-2776

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			X
Alpha > 125 and < 20,000	other locations			X
Beta > 1,500 and < 100,000	any location			X
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.				X
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity.				X

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 Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.				

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 Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, 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	9/14/17
(Signature) Sherri Sherwood	3pm

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2776

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
432872	EPA:120.1	1				
432872	EPA:150.1	1				
432872	EPA:160.1	1				
432872	EPA:170.0	2		1		
432872	EPA:245.2	2				
432872	EPA:300.0	1				
432872	EPA:310.1	1				
432872	EPA:335.4	1				
432872	EPA:350.1	1				
432872	EPA:351.2	1				
432872	EPA:353.2	1				
432872	EPA:365.4	1				
432872	SM:A2340B	1				
432872	SW-846:6010C	1				
432872	SW-846:6020	1				
432872	SW-846:6850	1				
432872	SW-846:8260B	1		1		
432872	SW-846:8270D	1				
432872	SW-846:8330B	1				
432872	SW-846:9060	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
432872	EPA:120.1	1705527	1705527	1										1				1			
432872	EPA:150.1	1700639	1700639	1										1				1			
432872	EPA:160.1	1700497	1700497	1					1					1				1			
432872	EPA:170.0	NA	NA	2		1															

DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
432872	EPA:245.2	1702521	1702509	2					1	1				1			1				
432872	EPA:300.0	1703207	1703207	1					1					1			1				
432872	EPA:310.1	1700638	1700638	1						1				1			1				
432872	EPA:335.4	1700910	1700909	1					1	1				1			1				
432872	EPA:350.1	1700465	1700464	1					1	1				1			1				
432872	EPA:351.2	1701316	1701315	1					1	1				1			1				
432872	EPA:353.2	1701312	1701312	1					1					1			1				
432872	EPA:365.4	1701314	1701313	1					1	1				1			1				
432872	SM:A2340B	1706554	1706554	1																	
432872	SW-846:6010C	1701155	1701154	1					1	1				1			1				
432872	SW-846:6020	1701124	1701123	1					1	1				1			1				
432872	SW-846:6850	1702207	1702204	1					1	1	1			1							
432872	SW-846:8260B	1701572	1701572	1		1			1					2							
432872	SW-846:8270D	1701047	1701046	1					1	1	1			1	1						
432872	SW-846:8330B	1701357	1701355	1					1	1	1			1							
432872	SW-846:9060	1701620	1701620	1					1					1			1				

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142883	432872001	REG	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-17-142883	432872001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-143050	1203875001	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203875000	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142883	432872001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142887	1203874648	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203874647	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203874646	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-142883	432872001	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAWA-17-142918	432872002	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-143033	432872004	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142883	432872001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142918	432872002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203879600	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203879599	MB	1	0	0	0
EPA:245.2	INORGANIC	WT_IPC-17-133234	1203879607	DUP	1	0	0	0
EPA:245.2	INORGANIC	WT_IPC-17-133234	1203879609	MS	0	0	1	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142883	432872001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-143050	1203881302	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203881301	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203881300	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142883	432872001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-143050	1203874998	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-143050	1203874999	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203874996	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142918	1203876737	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142918	1203876738	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142918	432872002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203875703	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203875702	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142856	1203874557	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142856	1203874558	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142883	432872001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203874556	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203874555	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142918	432872002	REG	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-17-142883	432872001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142884	1203876760	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203876757	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203876756	MB	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-17-142883	432872001	REG	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

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SM:A2340B	INORGANIC	CAWA-17-142883	432872001	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142883	1203876402	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142883	1203876403	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-142883	432872001	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203876401	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203876400	MB	17	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142883	1203876322	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142883	1203876323	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-142883	432872001	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203876321	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203876320	MB	11	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-17-142883	432872001	REG	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-17-142918	432872003	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143033	432872004	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203878617	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203878618	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203878616	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-17-142918	1203876072	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-142918	1203876073	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-142918	432872003	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203876066	LCS	0	6	76	0
SW-846:8270D	SVOC	LCSD	1203877908	LCSD	0	6	76	0
SW-846:8270D	SVOC	MB	1203876065	MB	80	6	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142900	1203876873	MS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142900	1203876874	MSD	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142918	432872002	REG	23	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203876872	LCS	0	1	23	0
SW-846:8330B	LCMS/MS HIGH	MB	1203876871	MB	23	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142891	1203877659	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142918	432872002	REG	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

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	1203876320	METHOD BLANK	SW-846:6020	W	Molybdenum	0.287	J	ug/L	0.500
CAWA-17-143033	432872004	TRIP BLANK	EPA:170.0	W	Temperature	3		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-17-142883	1203876320	METHOD BLANK	SW-846:6020	Molybdenum	0.287	ug/L	0.65		0.500	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

DATA VALIDATION REPORT

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-17-142918	1203876072	1203876073	SW-846:8270D	Nitrophenol[4-]	1701046	09-19-2017	W	71	86	85	17		19	30
CAWA-17-142918	1203876072	1203876073	SW-846:8270D	Pentachlorophenol	1701046	09-19-2017	W	124	114	121	35		9	30

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203876066	1203877908	SW-846:8270D	Aniline	1701046	09-19-2017	W	120	119	112	49			1	30
1203876066	1203877908	SW-846:8270D	Benzidine	1701046	09-19-2017	W	111	72	144	20			43	30
1203876066	1203877908	SW-846:8270D	Benzyl Alcohol	1701046	09-19-2017	W	104	108	102	44			4	30
1203876066	1203877908	SW-846:8270D	Bis(2-chloroethyl)ether	1701046	09-19-2017	W	130	126	111	51			3	30
1203876066	1203877908	SW-846:8270D	Chloro-3-methylphenol[4-]	1701046	09-19-2017	W	123	115	115	55			7	30
1203876066	1203877908	SW-846:8270D	Chlorophenol[2-]	1701046	09-19-2017	W	124	118	105	49			5	30
1203876066	1203877908	SW-846:8270D	Dioxane[1,4-]	1701046	09-19-2017	W	79	77	78	38			2	30
1203876066	1203877908	SW-846:8270D	Fluoranthene	1701046	09-19-2017	W	120	105	118	54			13	30
1203876066	1203877908	SW-846:8270D	Methylphenol[2-]	1701046	09-19-2017	W	106	104	101	41			2	30
1203876066	1203877908	SW-846:8270D	Methylphenol[3-,4-]	1701046	09-19-2017	W	113	112	102	43			1	30
1203876066	1203877908	SW-846:8270D	Nitroso-di-n-propylamine[N-]	1701046	09-19-2017	W	143	140	115	54			2	30
1203876066	1203877908	SW-846:8270D	Nitrosopyrrolidine[N-]	1701046	09-19-2017	W	126	125	113	54			1	30
1203876066	1203877908	SW-846:8270D	Oxybis(1-chloropropane)[2,2'-]	1701046	09-19-2017	W	124	121	123	44			2	30
1203876066	1203877908	SW-846:8270D	Pentachlorophenol	1701046	09-19-2017	W	121	118	116	41			3	30

9. Any Field Duplicate RPDs outside the desired limits?

DATA VALIDATION REPORT

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-47	2017-2776	CAWA-17-142883	REG	INIT	INORGANIC	SW-846:6020	Molybdenum		U	I4	N	0.65	ug/L	0.65	ug/L			W	09/13/2017		1701124	VAL	Y

Reason Code

Description

I4

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

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142883	R-47	REG	EPA:120.1	0	1
CAWA-17-142883	R-47	REG	EPA:150.1	0	1
CAWA-17-142883	R-47	REG	EPA:160.1	0	1
CAWA-17-142883	R-47	REG	EPA:170.0	0	1
CAWA-17-142883	R-47	REG	EPA:245.2	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142883	R-47	REG	EPA:300.0	0	4
CAWA-17-142883	R-47	REG	EPA:310.1	0	2
CAWA-17-142883	R-47	REG	EPA:350.1	0	1
CAWA-17-142883	R-47	REG	EPA:353.2	0	1
CAWA-17-142883	R-47	REG	EPA:365.4	0	1
CAWA-17-142883	R-47	REG	SM:A2340B	0	1
CAWA-17-142883	R-47	REG	SW-846:6010C	0	17
CAWA-17-142883	R-47	REG	SW-846:6020	0	11
CAWA-17-142883	R-47	REG	SW-846:6850	0	1
CAWA-17-142918	R-47	REG	EPA:170.0	0	1
CAWA-17-142918	R-47	REG	EPA:245.2	0	1
CAWA-17-142918	R-47	REG	EPA:335.4	0	1
CAWA-17-142918	R-47	REG	EPA:351.2	0	1
CAWA-17-142918	R-47	REG	SW-846:8260B	0	80
CAWA-17-142918	R-47	REG	SW-846:8270D	0	80
CAWA-17-142918	R-47	REG	SW-846:8330B	0	23
CAWA-17-142918	R-47	REG	SW-846:9060	0	1
CAWA-17-143033	R-47	FTB	EPA:170.0	0	1
CAWA-17-143033	R-47	FTB	SW-846:8260B	0	80

September 25, 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: 432872
SDG: 2017-2776

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on September 15, 2017, and analyzed for Explosives by LCMSMS, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Katrina Hiott for
Valerie Davis
Project Manager

Chain of Custody: 2017-2776
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 432872
SDG: 2017-2776

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	10
Volatile Analysis.....	13
Case Narrative.....	14
Sample Data Summary.....	19
Quality Control Summary.....	26
Quality Control Data.....	44
Semi-Volatile Analysis.....	66
Case Narrative.....	67
Sample Data Summary.....	73
Quality Control Summary.....	77
Quality Control Data.....	96
Perchlorates by LCMSMS Analysis.....	112
Case Narrative.....	113
Sample Data Summary.....	119
Quality Control Summary.....	121
Quality Control Data.....	124
Explosives by LCMSMS Analysis.....	130
Case Narrative.....	131

Sample Data Summary.....	136
Quality Control Summary.....	139
Quality Control Data.....	143
Metals Analysis.....	158
Case Narrative.....	159
Sample Data Summary.....	164
Quality Control Summary.....	169
General Chem Analysis.....	183
Case Narrative.....	184
Sample Data Summary.....	214
Quality Control Summary.....	218

Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 432872
SDG # : 2017-2776**

September 25, 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 15, 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). 432872004(CAWA-17-143033) was received with head space.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
432872001	CAWA-17-142883
432872002	CAWA-17-142918
432872003	CAWA-17-142918
432872004	CAWA-17-143033

Case Narrative

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

Data Package

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

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


Katrina Hiott for
Valerie Davis
Project Manager

List of current GEL Certifications as of 25 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 SC

Chain of Custody/Analysis Request

COC/Lab Request #:

2017-2776

Page 1 of 1

Client Contact:

Lab Agreement #:

Project Number:

Analysis Turnaround Time:

24 Hour - ☐

7 Days - ☐

14 Days - ☐

21 Days - ☐

28 Days - ☒

Other - ☐

Field Sample ID

Sample Date

Sample Time

Sample Matrix

CAWA-17-142883

Sep 13 2017

10:44

W

CAWA-17-142918

Sep 13 2017

10:44

W

CAWA-17-143033

Sep 13 2017

10:44

W

Site Name: Los Alamos National Laboratory

MSGP-Hg

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8330B-NMED HEXMOD

WSP-All Metals

WSP-CN(T)

WSP-GENINORG+PerChlorate

WSP-NH3+NO3/NO2+PO4

WSP-TKN+TOC

Rad Screening Info:

Yes, Below Background

Lab Reporting Limit Type:

Sample Quantitation Limit

MDL

Special Instructions:

Relinquished by:

Print Name:

Print Name:

Date/Time:

Received by:

Date/Time:

Print Name:

Date/Time:

Date/Time:

Relinquished by:

Print Name:

Print Name:

Date/Time:

Received by:

Date/Time:

Print Name:

Date/Time:

Date/Time:

COC: 2017-2776

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			X
Alpha > 125 and < 20,000	other locations			X
Beta > 1,500 and < 100,000	any location			X
Alpha activity \geq 20,000 dpm/100cm ² and beta activity \geq 100,000 dpm/100cm ² and \geq 0.5 mR/hr on the external surface of the package.				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 field screening measurements of alpha and beta activity.				X

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	9/14/17
(Signature) Sherri Sherwood	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: 14SEP17
ACTWGT: 54.0 LB MAN
CAD: 0014176/CAFE2916

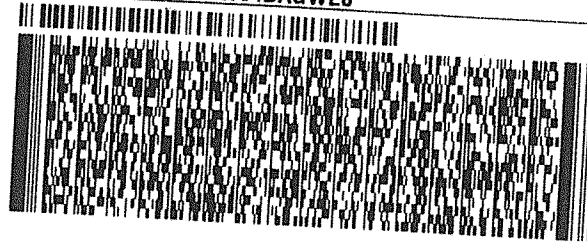
BILL SENDER

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

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



2 of 2

MPS# **5908 1782 7214**

Mstr# 5908 1782 7203

0201

FRI - 15 SEP 10:30
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS



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: 14SEP17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

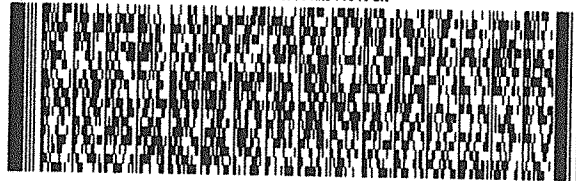
BILL SENDER

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

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



1 of 2

TRK# **5908 1782 7203**

MASTER

FRI - 15 SEP 10:30
PRIORITY OVERNIGHT

X7 RBWA

29407
SC-US CHS





Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>432872</u>	
Received By: <u>ZKW</u>		Date Received: <u>9/15/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="radio"/> FedEx Express <input type="radio"/> FedEx Ground <input type="radio"/> UPS <input type="radio"/> Field Services <input type="radio"/> Courier <input type="radio"/> Other	
		<u>5908 1782 7214</u> <u>5908 1782 7203</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <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. <input type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium <input type="checkbox"/> Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <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 ___ No <input checked="" type="checkbox"/> N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: <u>-143033 read w/ headspace</u>
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:
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 checked="" type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

RHOTT

Date

9/15/17

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 #: 2017-2776
Work Order #: 432872**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1701572

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
432872003	CAWA-17-142918
432872004	CAWA-17-143033
1203877503	432587002(CAWA-17-142901) Post Spike (PS)
1203877504	432587002(CAWA-17-142901) Post Spike (PS)
1203877505	432587002(CAWA-17-142901) Post Spike Duplicate (PSD)
1203877506	432587002(CAWA-17-142901) Post Spike Duplicate (PSD)
1203878616	Method Blank (MB)
1203878617	Laboratory Control Sample (LCS)
1203878618	Laboratory Control Sample (LCS)

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

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

SOP Reference

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

Calibration Information

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

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 432587002 (CAWA-17-142901) 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:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOAA.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890A/HP5975C	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: 2017-2776 GEL Work Order: 432872

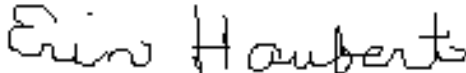
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 11 OCT 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 21:52	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 21:52		
Data File: 091917\AA221.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: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 21:52	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 21:52		
Data File: 091917\AA221.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	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: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 21:52	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 21:52		
Data File: 091917\AA221.D	Column: DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	55.5	50.0	ug/L 111	(71%-134%)
Bromofluorobenzene	50.8	50.0	ug/L 102	(70%-131%)
Toluene-d8	52.2	50.0	ug/L 104	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	10.9	ug/L	0	J
	unknown	3.483	21.7	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776

Lab Sample ID: 432872004

Date Collected: 09/13/2017 10:44

Date Received: 09/15/2017 08:55

Matrix: W

Client ID: CAWA-17-143033

Batch ID: 1701572

Run Date: 09/19/2017 22:15

Prep Date: 09/19/2017 22:15

Data File: 091917\AA222.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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	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: 2017-2776

Lab Sample ID: 432872004

Date Collected: 09/13/2017 10:44

Date Received: 09/15/2017 08:55

Matrix: W

Client ID: CAWA-17-143033

Batch ID: 1701572

Run Date: 09/19/2017 22:15

Prep Date: 09/19/2017 22:15

Data File: 091917\AA222.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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	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: 2017-2776
Lab Sample ID: 432872004

Client ID: CAWA-17-143033
Batch ID: 1701572
Run Date: 09/19/2017 22:15
Prep Date: 09/19/2017 22:15
Data File: 091917\AA222.D

Date Collected: 09/13/2017 10:44
Date Received: 09/15/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: VXY1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	57.8	50.0	ug/L 116	(71%-134%)
Bromofluorobenzene	52.2	50.0	ug/L 104	(70%-131%)
Toluene-d8	53.2	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	9.68	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2776**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203878617	LCS for batch 1701572	108	99	96
1203878618	LCS for batch 1701572	105	103	98
1203878616	MB for batch 1701572	110	104	101
1203877503	CAWA-17-142901PS	107	100	97
1203877505	CAWA-17-142901PSD	110	103	98
1203877504	CAWA-17-142901PS	108	105	100
1203877506	CAWA-17-142901PSD	106	101	97
432872003	CAWA-17-142918	111	104	102
432872004	CAWA-17-143033	116	106	104

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(71%-134%)

TOL = Toluene-d8

(74%-124%)

BFB = Bromofluorobenzene

(70%-131%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-2776

Sample Type: Post Spike

Client ID: CAWA-17-142901PS

Matrix: W

Lab Sample ID 1203877503

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	104	104	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1300	104	56-131
67-64-1	PS Acetone	250	0.00 U	157	63	25-155
74-88-4	PS Iodomethane	250	0.00 U	263	105	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	277	111	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	275	110	48-133
78-93-3	PS 2-Butanone	250	0.00 U	202	81	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	261	104	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	231	92	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	33.2	66	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.8	90	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	51.8	104	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	42.9	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	50.2	100	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	52.2	104	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	53.5	107	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	55.3	111	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	52.9	106	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	58.5	117	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	57.1	114	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	56.4	113	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	54.6	109	69-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2776

Sample Type: Post Spike

Client ID: CAWA-17-142901PS

Matrix: W

Lab Sample ID 1203877503

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	63.2	126	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	53.2	106	71-130
67-66-3	PS Chloroform	50.0	0.00 U	53.9	108	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	54.8	110	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	52.6	105	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	57.4	115	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	55.1	110	69-130
71-43-2	PS Benzene	50.0	0.00 U	52.7	105	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	54.3	109	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	54.8	110	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	53.9	108	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	57.8	116	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	58.3	117	70-134
108-88-3	PS Toluene	50.0	0.00 U	51.4	103	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	59.8	120	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	52.6	105	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	51.9	104	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	50.9	102	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	49.7	99	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	54.3	109	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	51.1	102	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	51.6	103	61-130

Volatile
Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2776

Sample Type: Post Spike

Client ID: CAWA-17-142901PS

Matrix: W

Lab Sample ID 1203877503

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	51.4	103	62-131
100-42-5	PS Styrene	50.0	0.00 U	52.5	105	59-135
75-25-2	PS Bromoform	50.0	0.00 U	61.2	122	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	51.4	103	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	53.0	106	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	52.0	104	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	51.5	103	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	52.0	104	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	52.7	105	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	51.8	104	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	51.5	103	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	51.3	103	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	52.7	105	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	52.7	105	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	53.3	107	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	51.4	103	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	51.6	103	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	53.8	108	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	57.9	116	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	51.7	103	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	50.8	102	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	51.5	103	52-135

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-2776

Sample Type: Post Spike

Client ID: CAWA-17-142901PS

Matrix: W

Lab Sample ID 1203877503

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:20

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	52.4	105	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	57.6	115	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	50.8	102	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5220	104	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-2776

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142901PSD

Matrix: W

Lab Sample ID 1203877505

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:43

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	105	105	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1350	108	56-131	4	0-20
67-64-1	PSD Acetone	250	0.00 U	163	65	25-155	4	0-20
74-88-4	PSD Iodomethane	250	0.00 U	268	107	66-133	2	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	285	114	61-141	3	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	273	109	48-133	1	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	210	84	25-143	4	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	270	108	61-127	4	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	238	95	33-138	3	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	32.9	66	33-164	1	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	47.0	94	53-139	5	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	51.2	102	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	42.1	84	59-146	2	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	50.1	100	65-129	0	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	52.2	104	65-141	0	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	52.7	105	69-127	2	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	56.4	113	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	53.6	107	62-123	1	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	59.0	118	69-132	1	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	58.1	116	65-127	2	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	57.0	114	67-127	1	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	54.8	110	69-127	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-2776

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142901PSD

Matrix: W

Lab Sample ID 1203877505

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:43

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	64.5	129	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	53.3	107	71-130	0	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	54.3	109	71-129	1	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	56.3	113	69-139	3	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	53.6	107	67-130	2	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	59.2	118	66-143	3	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	55.0	110	69-130	0	0-20
71-43-2	PSD Benzene	50.0	0.00 U	53.3	107	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	55.4	111	65-131	2	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	54.9	110	67-127	0	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	54.4	109	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	58.0	116	70-138	0	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	58.1	116	70-134	0	0-20
108-88-3	PSD Toluene	50.0	0.00 U	52.2	104	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	59.7	119	69-135	0	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	52.7	105	66-125	0	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	51.9	104	67-124	0	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	52.1	104	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	49.8	100	68-143	0	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	54.9	110	71-127	1	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	51.7	103	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	52.4	105	61-130	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2776

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142901PSD

Matrix: W

Lab Sample ID 1203877505

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:43

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00 U	52.1	104	62-131	1	0-20
100-42-5	PSD Styrene	50.0	0.00 U	52.6	105	59-135	0	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	61.5	123	64-138	0	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	51.9	104	55-133	1	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	53.8	108	62-129	2	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	52.8	106	70-124	1	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	51.0	102	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	52.3	105	50-133	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	53.1	106	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	51.8	104	56-128	0	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	51.5	103	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	51.8	104	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	52.9	106	53-132	0	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	53.3	107	50-138	1	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	53.6	107	49-138	1	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	51.6	103	56-126	0	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	51.8	104	55-125	0	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	54.3	109	43-142	1	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	60.2	120	62-141	4	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	52.5	105	40-147	2	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	52.5	105	62-134	3	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	51.9	104	52-135	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2776

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142901PSD

Matrix: W

Lab Sample ID 1203877505

Instrument: VOAA.I

Analysis Date: 09/19/2017 16:43

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	52.9	106	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	58.4	117	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	50.8	102	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	5500	110	60-140	5	0-20

Volatile

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2776

Sample Type: Post Spike

Client ID: CAWA-17-142901PS

Matrix: W

Lab Sample ID 1203877504

Instrument: VOAA.I

Analysis Date: 09/19/2017 17:07

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	296	119	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	264	106	57-149
107-05-1	PS Allyl chloride	250	0.00 U	251	100	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	238	95	59-129
107-12-0	PS Propionitrile	250	0.00 U	229	92	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	238	95	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	241	97	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	244	97	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2610	105	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	45.9	92	63-146

Volatile

Page 2 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2776

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142901PSD

Matrix: W

Lab Sample ID 1203877506

Instrument: VOAA.I

Analysis Date: 09/19/2017 17:31

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00	U	307	123	49-141	3	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	U	266	106	57-149	0	0-20
107-05-1	PSD Allyl chloride	250	0.00	U	259	104	54-128	3	0-20
107-13-1	PSD Acrylonitrile	250	0.00	U	258	103	59-129	8	0-20
107-12-0	PSD Propionitrile	250	0.00	U	248	99	58-131	8	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	U	255	102	59-134	7	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	U	260	104	62-135	7	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	U	256	102	60-136	5	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	U	2860	114	60-143	9	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	U	47.0	94	63-146	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701572

Matrix: WATER

Lab Sample ID 1203878617

Instrument: VOAA.I

Analysis Date: 09/19/2017 14:44

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	106	106	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1370	110	61-125
67-64-1	LCS Acetone	250	0.0	355	142	48-157
74-88-4	LCS Iodomethane	250	0.0	273	109	72-128
75-15-0	LCS Carbon disulfide	250	0.0	291	116	69-138
108-05-4	LCS Vinyl acetate	250	0.0	276	111	67-125
78-93-3	LCS 2-Butanone	250	0.0	312	125	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	276	110	66-124
591-78-6	LCS 2-Hexanone	250	0.0	333	133	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	31.9	64	40-160
74-87-3	LCS Chloromethane	50.0	0.0	48.0	96	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	51.4	103	65-137
74-83-9	LCS Bromomethane	50.0	0.0	40.7	81	63-137
75-00-3	LCS Chloroethane	50.0	0.0	51.0	102	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	52.0	104	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	53.1	106	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	58.3	117	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	54.9	110	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	60.6	121	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	58.9	118	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	57.9	116	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	55.4	111	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701572

Matrix: WATER

Lab Sample ID 1203878617

Instrument: VOAA.I

Analysis Date: 09/19/2017 14:44

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	65.8	132	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	53.7	107	76-125
67-66-3	LCS Chloroform	50.0	0.0	55.1	110	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	57.7	115	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	54.5	109	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	60.3	121	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	55.4	111	74-122
71-43-2	LCS Benzene	50.0	0.0	54.0	108	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	56.0	112	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	55.6	111	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	54.7	109	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	58.7	117	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	58.8	118	78-131
108-88-3	LCS Toluene	50.0	0.0	52.1	104	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	60.3	121	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	53.1	106	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	52.0	104	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	52.0	104	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	50.3	101	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	54.9	110	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	51.7	103	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	52.7	105	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701572

Matrix: WATER

Lab Sample ID 1203878617

Instrument: VOAA.I

Analysis Date: 09/19/2017 14:44

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	52.4	105	74-126
100-42-5	LCS Styrene	50.0	0.0	54.3	109	72-130
75-25-2	LCS Bromoform	50.0	0.0	61.1	122	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	51.6	103	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	53.1	106	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	52.3	105	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.8	102	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	52.2	104	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	53.0	106	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	51.7	103	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	51.4	103	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	51.3	103	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	52.9	106	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	53.0	106	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	53.5	107	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	51.1	102	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	51.3	103	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	54.0	108	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	59.5	119	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	50.9	102	72-136
91-20-3	LCS Naphthalene	50.0	0.0	51.1	102	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	50.8	102	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701572

Matrix: WATER

Lab Sample ID 1203878617

Instrument: VOAA.I

Analysis Date: 09/19/2017 14:44

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	51.9	104	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	58.8	118	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	50.3	101	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5560	111	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701572

Matrix: WATER

Lab Sample ID 1203878618

Instrument: VOAA.I

Analysis Date: 09/19/2017 15:32

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1701572

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	307	123	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	289	116	61-148
107-05-1	LCS Allyl chloride	250	0.0	270	108	59-125
107-13-1	LCS Acrylonitrile	250	0.0	255	102	65-122
107-12-0	LCS Propionitrile	250	0.0	244	98	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	255	102	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	259	103	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	105	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2790	112	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	49.6	99	66-147

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2776	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1701572	Instrument ID:	VOAA.I	Data File:	091917\AA206.D
Lab Sample ID:	1203878616	Prep Date:	09/19/2017 15:56	Analyzed:	09/19/17 15:56
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1701572	1203878617	091917\AA203L.D	09/19/17	1444
02 LCS for batch 1701572	1203878618	091917\AA205.D	09/19/17	1532
03 CAWA-17-142901PS	1203877503	091917\AA207.D	09/19/17	1620
04 CAWA-17-142901PSD	1203877505	091917\AA208.D	09/19/17	1643
05 CAWA-17-142901PS	1203877504	091917\AA209.D	09/19/17	1707
06 CAWA-17-142901PSD	1203877506	091917\AA210.D	09/19/17	1731
07 CAWA-17-142918	432872003	091917\AA221.D	09/19/17	2152
08 CAWA-17-143033	432872004	091917\AA222.D	09/19/17	2215

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877503	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:20		
Data File: 091917\AA207.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		57.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		54.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		53.0	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		56.4	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		55.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		52.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		51.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		52.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		52.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		57.9	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.3	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		55.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		54.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		52.7	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		51.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		51.6	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		63.2	ug/L	0.300	1.00
78-93-3	2-Butanone		202	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		51.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		231	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		51.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.3	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		261	ug/L	1.50	5.00
67-64-1	Acetone		157	ug/L	1.50	10.0
75-05-8	Acetonitrile		1300	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		52.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		51.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		53.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		57.8	ug/L	0.300	1.00
75-25-2	Bromoform		61.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877503	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:20		
Data File: 091917\AA207.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		277	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		57.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.1	ug/L	0.300	1.00
75-00-3	Chloroethane		50.2	ug/L	0.300	1.00
67-66-3	Chloroform		53.9	ug/L	0.300	1.00
74-87-3	Chloromethane		44.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		49.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		53.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		33.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		53.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		51.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		51.7	ug/L	0.300	1.00
74-88-4	Iodomethane		263	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.4	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		52.9	ug/L	1.00	10.0
91-20-3	Naphthalene		50.8	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.5	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.9	ug/L	0.300	1.00
108-88-3	Toluene		51.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		54.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		52.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		275	ug/L	1.50	5.00
75-01-4	Vinyl chloride		51.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		54.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		58.3	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		104	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5220	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		53.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		52.0	ug/L	0.300	1.00
95-47-6	o-Xylene		51.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		52.7	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877503	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:20	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:20		
Data File: 091917\AA207.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		58.5	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		51.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		57.1	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.8	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.6	50.0	107	(71%-134%)
Bromofluorobenzene	48.5	50.0	97	(70%-131%)
Toluene-d8	50.2	50.0	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2017-2776	Date Collected:	09/08/2017 13:32	Matrix:	W
Lab Sample ID:	1203877504	Date Received:	09/13/2017 09:20		
Client Sample:	QC for batch 1701572	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142901PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1701572	Inst:	VOAA.I	Dilution:	1
Run Date:	09/19/2017 17:07	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	09/19/2017 17:07				
Data File:	091917\AA209.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		45.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		296	ug/L	1.50	5.00
107-13-1	Acrylonitrile		238	ug/L	1.50	5.00
107-05-1	Allyl chloride		251	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: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877504	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 17:07	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 17:07		
Data File: 091917\AA209.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		244	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		2610	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		238	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		241	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		229	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		264	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: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877504	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 17:07	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 17:07		
Data File: 091917\AA209.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	54.1	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	50.1	50.0	ug/L 100	(70%-131%)
Toluene-d8	52.5	50.0	ug/L 105	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877505	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:43	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:43		
Data File: 091917\AA208.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		58.4	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		56.3	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		53.8	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		52.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		57.0	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		56.4	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		53.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		51.9	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		52.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		52.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		60.2	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.9	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		55.0	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		54.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		53.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		51.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		51.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		64.5	ug/L	0.300	1.00
78-93-3	2-Butanone		210	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		51.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		238	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		51.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		270	ug/L	1.50	5.00
67-64-1	Acetone		163	ug/L	1.50	10.0
75-05-8	Acetonitrile		1350	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		53.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		51.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		53.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		58.0	ug/L	0.300	1.00
75-25-2	Bromoform		61.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877505	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:43	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:43		
Data File: 091917\AA208.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		285	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		59.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.7	ug/L	0.300	1.00
75-00-3	Chloroethane		50.1	ug/L	0.300	1.00
67-66-3	Chloroform		54.3	ug/L	0.300	1.00
74-87-3	Chloromethane		47.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		49.8	ug/L	0.300	1.00
74-95-3	Dibromomethane		54.4	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		32.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		52.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		52.5	ug/L	0.300	1.00
74-88-4	Iodomethane		268	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.9	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		53.6	ug/L	1.00	10.0
91-20-3	Naphthalene		52.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		52.6	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.1	ug/L	0.300	1.00
108-88-3	Toluene		52.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		55.4	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		52.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		273	ug/L	1.50	5.00
75-01-4	Vinyl chloride		51.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		54.8	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		58.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		105	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5500	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		52.3	ug/L	0.300	1.00
95-47-6	o-Xylene		52.1	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		53.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877505	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 16:43	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 16:43		
Data File: 091917\AA208.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		59.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		51.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		58.1	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		59.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.8	50.0	110	(71%-134%)
Bromofluorobenzene	49.0	50.0	98	(70%-131%)
Toluene-d8	51.4	50.0	103	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877506	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 17:31	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 17:31		
Data File: 091917\AA210.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		47.0	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		307	ug/L	1.50	5.00
107-13-1	Acrylonitrile		258	ug/L	1.50	5.00
107-05-1	Allyl chloride		259	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:	2017-2776	Date Collected:	09/08/2017 13:32	Matrix:	W
Lab Sample ID:	1203877506	Date Received:	09/13/2017 09:20		
Client Sample:	QC for batch 1701572	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142901PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1701572	Inst:	VOAA.I	Dilution:	1
Run Date:	09/19/2017 17:31	Analyst:	VXY1	Purge Vol:	5 mL
Prep Date:	09/19/2017 17:31				
Data File:	091917\AA210.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		256	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		2860	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		260	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		266	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: 2017-2776	Date Collected: 09/08/2017 13:32	Matrix: W
Lab Sample ID: 1203877506	Date Received: 09/13/2017 09:20	
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: CAWA-17-142901PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 17:31	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 17:31		
Data File: 091917\AA210.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	52.9	50.0	106	(71%-134%)
Bromofluorobenzene	48.7	50.0	97	(70%-131%)
Toluene-d8	50.7	50.0	101	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776

Lab Sample ID: 1203878616

Client Sample: QC for batch 1701572

Client ID: MB for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 15:56

Prep Date: 09/19/2017 15:56

Data File: 091917\AA206.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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: 2017-2776	Matrix: WATER
Lab Sample ID: 1203878616	
Client Sample: QC for batch 1701572	Client: ARSL004
Client ID: MB for batch 1701572	Method: SW-846:8260B
Batch ID: 1701572	Project: QC
Run Date: 09/19/2017 15:56	SOP Ref: GL-OA-E-038
Prep Date: 09/19/2017 15:56	Dilution: 1
Data File: 091917\AA206.D	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: 2017-2776	Matrix: WATER	
Lab Sample ID: 1203878616		
Client Sample: QC for batch 1701572	Client: ARSL004	Project: QC
Client ID: MB for batch 1701572	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1701572	Inst: VOAA.I	Dilution: 1
Run Date: 09/19/2017 15:56	Analyst: VXY1	Purge Vol: 5 mL
Prep Date: 09/19/2017 15:56		
Data File: 091917\AA206.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	54.8	50.0	ug/L 110	(71%-134%)
Bromofluorobenzene	50.3	50.0	ug/L 101	(70%-131%)
Toluene-d8	52.1	50.0	ug/L 104	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	5.62	ug/L	0	J
	unknown	3.493	5.77	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776

Lab Sample ID: 1203878617

Client Sample: QC for batch 1701572

Client ID: LCS for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 14:44

Prep Date: 09/19/2017 14:44

Data File: 091917\AA203L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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		58.8	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		57.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		53.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		53.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		57.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		58.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		54.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		51.9	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		52.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		59.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.9	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		50.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		55.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		55.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		53.0	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		51.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		52.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		51.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		65.8	ug/L	0.300	1.00
78-93-3	2-Butanone		312	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		51.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		333	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		51.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.5	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		276	ug/L	1.50	5.00
67-64-1	Acetone		355	ug/L	1.50	10.0
75-05-8	Acetonitrile		1370	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		54.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.8	ug/L	0.300	1.00
74-97-5	Bromochloromethane		53.7	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		58.7	ug/L	0.300	1.00
75-25-2	Bromoform		61.1	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776

Lab Sample ID: 1203878617

Client Sample: QC for batch 1701572

Client ID: LCS for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 14:44

Prep Date: 09/19/2017 14:44

Data File: 091917\AA203L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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		40.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide		291	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		60.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		51.7	ug/L	0.300	1.00
75-00-3	Chloroethane		51.0	ug/L	0.300	1.00
67-66-3	Chloroform		55.1	ug/L	0.300	1.00
74-87-3	Chloromethane		48.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		50.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		54.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		31.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		53.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.7	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		50.9	ug/L	0.300	1.00
74-88-4	Iodomethane		273	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.6	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		54.9	ug/L	1.00	10.0
91-20-3	Naphthalene		51.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.3	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		52.0	ug/L	0.300	1.00
108-88-3	Toluene		52.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		56.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		52.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		276	ug/L	1.50	5.00
75-01-4	Vinyl chloride		51.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		55.4	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		58.8	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		106	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5560	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		52.2	ug/L	0.300	1.00
95-47-6	o-Xylene		52.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		53.0	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2776

Lab Sample ID: 1203878617

Client Sample: QC for batch 1701572

Client ID: LCS for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 14:44

Prep Date: 09/19/2017 14:44

Data File: 091917\AA203L.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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
1634-04-4	tert-Butyl methyl ether		60.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		51.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		58.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		60.3	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.9	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	47.9	50.0	ug/L 96	(70%-131%)
Toluene-d8	49.7	50.0	ug/L 99	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2776

Lab Sample ID: 1203878618

Client Sample: QC for batch 1701572

Client ID: LCS for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 15:32

Prep Date: 09/19/2017 15:32

Data File: 091917\AA205.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.I

Analyst: VXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	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		49.6	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		307	ug/L	1.50	5.00
107-13-1	Acrylonitrile		255	ug/L	1.50	5.00
107-05-1	Allyl chloride		270	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: 2017-2776

Lab Sample ID: 1203878618

Client Sample: QC for batch 1701572

Client ID: LCS for batch 1701572

Batch ID: 1701572

Run Date: 09/19/2017 15:32

Prep Date: 09/19/2017 15:32

Data File: 091917\AA205.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.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		261	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		2790	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		259	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		244	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		289	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:	2017-2776	Matrix:	WATER
Lab Sample ID:	1203878618		
Client Sample:	QC for batch 1701572	Client:	ARSL004
Client ID:	LCS for batch 1701572	Method:	SW-846:8260B
Batch ID:	1701572	Inst:	VOAA.I
Run Date:	09/19/2017 15:32	Analyst:	VXY1
Prep Date:	09/19/2017 15:32		
Data File:	091917\AA205.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	52.6	50.0	ug/L	105	(71%-134%)
Bromofluorobenzene	49.2	50.0	ug/L	98	(70%-131%)
Toluene-d8	51.4	50.0	ug/L	103	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2776
Work Order #: 432872**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1701047
Prep Batch Number:	1701046

Sample Analysis

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

Sample ID	Client ID
432872003	CAWA-17-142918
1203876065	Method Blank (MB)
1203876066	Laboratory Control Sample (LCS)
1203877908	Laboratory Control Sample Duplicate (LCSD)
1203876072	432872003(CAWA-17-142918) Matrix Spike (MS)
1203876073	432872003(CAWA-17-142918) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

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

Calibration Information

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

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

Initial Calibration

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

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for sample 432872003 (CAWA-17-142918) and the associated QC. However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. If required, a CRDL was analyzed after the CCVs to demonstrate that there is adequate sensitivity to detect the failed compounds at the applicable lower quantitation limit.

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was analyzed along with an MS/MSD pair in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS and/or LCSD (See Below) did not meet spike recovery acceptance criteria. Since the target analytes were not detected in the associated samples above the reporting limits, the positive bias had no adverse impact on the data.

Sample	Analyte	Value
1203876066 (LCS)	Several	See applicable report
1203877908 (LCSD)	Several	See applicable report

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD values between the LCS and LCSD (See Below) did not meet the acceptance limits for one or more analytes. Since the individual LCS and LCSD recoveries for these analytes were within the established acceptance criteria, the failures did not adversely impact the reported data.

Sample	Analyte	Value
1203876066 (LCS) and 1203877908 (LCSD)	Benzidine	43* (0%-30%)

QC Sample Designation

Sample 432872003 (CAWA-17-142918) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

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

Sample	Analyte	Value
1203876072 (CAWA-17-142918MS)	Pentachlorophenol	124* (35%-121%)
1203876073 (CAWA-17-142918MSD)	4-Nitrophenol	86* (17%-85%)

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information:**Holding Time Specifications**

All samples in this SDG in this batch met the specified holding time.

Preparation/Analytical Method Verification

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

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information:**Manual Integrations**

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

TIC Comment

Tentatively identified compounds (TIC) were requested for sample 432872003 (CAWA-17-142918) in this SDG in this batch.

Additional Comments

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

Electronic Package Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer

name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD4.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2776 GEL Work Order: 432872

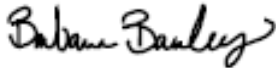
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Barbara Bailey

Date: 09 OCT 2017

Title: Data Validator

Sample Data Summary

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

Page 1 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:01	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1912.D	Column: DB-5ms	

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

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

Page 2 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:01	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1912.D	Column: DB-5ms	

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

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

Page 3 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 432872003	Date Received: 09/15/2017 08:55	
Client Sample: VOA/SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAWA-17-142918	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:01	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1912.D	Column: DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	90.6	100	ug/L	91	(32%-124%)
2-Fluorobiphenyl	32.2	50.0	ug/L	64	(32%-112%)
2-Fluorophenol	49.7	100	ug/L	50	(15%-88%)
Nitrobenzene-d5	38.8	50.0	ug/L	78	(36%-115%)
Phenol-d5	30.3	100	ug/L	30	(15%-91%)
p-Terphenyl-d14	51.1	50.0	ug/L	102	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	1.788	5.79	ug/L	0	J
	unknown	4.126	4.12	ug/L	0	J
	unknown	16.454	5.18	ug/L	0	J

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2776**Matrix Type: LIQUID**

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203876065	MB for batch 1701046	63	39	96	57	114	115
1203876066	LCS for batch 1701046	74	46	96	76	112	119
1203877908	LCSD for batch 1701046	72	46	88	68	116	119
432872003	CAWA-17-142918	50	30	78	64	91	102
1203876072	CAWA-17-142918MS	70	56	79	72	116	97
1203876073	CAWA-17-142918MSD	71	59	77	68	110	94

Surrogate**Acceptance Limits**

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701046

Matrix: WASTE WATER

Lab Sample ID 1203876066

Instrument: MSD4.I

Analysis Date: 09/19/2017 18:38

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	35.5	71	30-88
110-86-1	LCS Pyridine	50.0	0.0	36.4	73	27-89
62-53-3	LCS Aniline	50.0	0.0	60.2	120 *	49-112
108-95-2	LCS Phenol	50.0	0.0	26.3	53	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	65.0	130 *	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	61.9	124 *	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	42.7	85	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	43.8	88	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	45.5	91	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	62.0	124 *	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	52.0	104 *	44-102
95-48-7	LCS o-Cresol	50.0	0.0	53.1	106 *	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	56.4	113 *	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	71.6	143 *	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	42.1	84	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	51.4	103	53-115
78-59-1	LCS Isophorone	50.0	0.0	55.7	111	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	51.3	103	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	45.1	90	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	53.7	107	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	52.3	105	53-109
65-85-0	LCS Benzoic acid	100	0.0	37.1	37	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701046

Matrix: WASTE WATER

Lab Sample ID 1203876066

Instrument: MSD4.I

Analysis Date: 09/19/2017 18:38

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	63.7	127	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	35.8	72	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	61.6	123 *	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	41.5	83	42-103
91-20-3	LCS Naphthalene	50.0	0.0	42.0	84	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	42.6	85	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	19.9	40	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	48.9	98	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	55.8	112	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	38.8	78	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	52.7	105	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	65.5	131	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	52.8	106	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	55.2	110	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	60.9	122	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	44.9	90	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	49.2	98	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	50.5	101	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	47.7	95	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	58.3	117	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	56.6	113	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	13.6	27	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701046

Matrix: WASTE WATER

Lab Sample ID 1203876066

Instrument: MSD4.I

Analysis Date: 09/19/2017 18:38

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	51.3	103	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	50.9	102	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	59.0	118	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	55.1	110	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	45.9	92	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	45.9	92	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	47.0	94	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	47.4	95	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	60.7	121 *	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	50.2	100	55-110
120-12-7	LCS Anthracene	50.0	0.0	50.3	101	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	55.9	112	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	59.9	120 *	54-118
129-00-0	LCS Pyrene	50.0	0.0	52.1	104	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	54.3	109	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	53.4	107	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	50.2	100	57-112
218-01-9	LCS Chrysene	50.0	0.0	50.2	100	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	47.4	95	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	54.2	108	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	55.2	110	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	50.2	100	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1701046

Matrix: WASTE WATER

Lab Sample ID 1203876066

Instrument: MSD4.I

Analysis Date: 09/19/2017 18:38

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	45.9	92	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	46.3	93	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	43.8	88	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	39.4	79 *	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	63.1	126 *	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	39.9	80	44-102
1912-24-9	LCS Atrazine	50.0	0.0	56.9	114	60-131
92-87-5	LCS Benzidine	100	0.0	111	111	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	52.2	104	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	38.5	77	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1701046

Matrix: WATER

Lab Sample ID 1203877908

Instrument: MSD4.I

Analysis Date: 09/19/2017 19:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	LCSD N-Methyl-N-nitrosomethylam	50.0	0.0	35.0	70	30-88	1	0-30
110-86-1	LCSD Pyridine	50.0	0.0	33.7	67	27-89	8	0-30
62-53-3	LCSD Aniline	50.0	0.0	59.5	119 *	49-112	1	0-30
108-95-2	LCSD Phenol	50.0	0.0	25.8	52	16-82	2	0-30
111-44-4	LCSD bis(2-Chloroethyl) ether	50.0	0.0	63.1	126 *	51-111	3	0-30
95-57-8	LCSD 2-Chlorophenol	50.0	0.0	58.9	118 *	49-105	5	0-30
541-73-1	LCSD 1,3-Dichlorobenzene	50.0	0.0	39.9	80	37-95	7	0-30
106-46-7	LCSD 1,4-Dichlorobenzene	50.0	0.0	39.9	80	38-96	9	0-30
95-50-1	LCSD 1,2-Dichlorobenzene	50.0	0.0	42.9	86	39-97	6	0-30
108-60-1	LCSD bis(2-Chloro-1-methylethyl)et	50.0	0.0	60.7	121	44-123	2	0-30
100-51-6	LCSD Benzyl alcohol	50.0	0.0	54.1	108 *	44-102	4	0-30
95-48-7	LCSD o-Cresol	50.0	0.0	52.0	104 *	41-101	2	0-30
65794-96-9	LCSD m,p-Cresols	50.0	0.0	55.8	112 *	43-102	1	0-30
621-64-7	LCSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	70.0	140 *	54-115	2	0-30
67-72-1	LCSD Hexachloroethane	50.0	0.0	39.8	80	36-96	5	0-30
98-95-3	LCSD Nitrobenzene	50.0	0.0	47.1	94	53-115	9	0-30
78-59-1	LCSD Isophorone	50.0	0.0	51.0	102	56-117	9	0-30
88-75-5	LCSD 2-Nitrophenol	50.0	0.0	47.9	96	51-113	7	0-30
105-67-9	LCSD 2,4-Dimethylphenol	50.0	0.0	41.4	83	51-104	8	0-30
111-91-1	LCSD bis(2-Chloroethoxy)methane	50.0	0.0	50.0	100	55-114	7	0-30
120-83-2	LCSD 2,4-Dichlorophenol	50.0	0.0	49.2	98	53-109	6	0-30
65-85-0	LCSD Benzoic acid	100	0.0	38.6	39	21-74	4	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1701046

Matrix: WATER

Lab Sample ID 1203877908

Instrument: MSD4.I

Analysis Date: 09/19/2017 19:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	LCSD 4-Chloroaniline	50.0	0.0	58.8	118	65-136	8	0-30
87-68-3	LCSD Hexachlorobutadiene	50.0	0.0	31.0	62	35-98	15	0-30
59-50-7	LCSD Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	57.4	115	55-115	7	0-30
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	37.2	74	42-103	11	0-30
91-20-3	LCSD Naphthalene	50.0	0.0	37.1	74	44-102	12	0-30
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	38.0	76	45-108	12	0-30
77-47-4	LCSD Hexachlorocyclopentadiene	50.0	0.0	18.4	37	34-89	8	0-30
88-06-2	LCSD 2,4,6-Trichlorophenol	50.0	0.0	46.9	94	55-120	4	0-30
95-95-4	LCSD 2,4,5-Trichlorophenol	50.0	0.0	54.1	108	55-116	3	0-30
91-58-7	LCSD 2-Chloronaphthalene	50.0	0.0	37.0	74	44-107	5	0-30
88-74-4	LCSD 2-Nitroaniline o-Nitroaniline	50.0	0.0	50.0	100	53-121	5	0-30
99-09-2	LCSD 3-Nitroaniline m-Nitroaniline	50.0	0.0	61.9	124	61-139	6	0-30
131-11-3	LCSD Dimethylphthalate	50.0	0.0	49.6	99	60-122	6	0-30
606-20-2	LCSD 2,6-Dinitrotoluene	50.0	0.0	51.8	104	59-122	6	0-30
121-14-2	LCSD 2,4-Dinitrotoluene	50.0	0.0	55.7	111	57-124	9	0-30
208-96-8	LCSD Acenaphthylene	50.0	0.0	42.2	84	50-113	6	0-30
83-32-9	LCSD Acenaphthene	50.0	0.0	46.1	92	49-112	6	0-30
51-28-5	LCSD 2,4-Dinitrophenol	50.0	0.0	50.8	102	34-122	1	0-30
132-64-9	LCSD Dibenzofuran	50.0	0.0	44.8	90	50-111	6	0-30
58-90-2	LCSD 2,3,4,6-Tetrachlorophenol	50.0	0.0	54.8	110	54-122	6	0-30
84-66-2	LCSD Diethylphthalate	50.0	0.0	52.2	104	57-122	8	0-30
100-02-7	LCSD 4-Nitrophenol	50.0	0.0	13.2	26	15-137	3	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1701046

Matrix: WATER

Lab Sample ID 1203877908

Instrument: MSD4.I

Analysis Date: 09/19/2017 19:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	LCSD Fluorene	50.0	0.0	47.9	96	52-114	7	0-30
7005-72-3	LCSD 4-Chlorophenylphenylether	50.0	0.0	47.8	96	52-121	6	0-30
100-01-6	LCSD 4-Nitroaniline <i>p</i> -Nitroaniline	50.0	0.0	52.7	105	44-137	11	0-30
534-52-1	LCSD 2-Methyl-4,6-dinitrophenol	50.0	0.0	53.4	107	45-124	3	0-30
122-39-4	LCSD Diphenylamine	50.0	0.0	44.3	89	55-113	3	0-30
122-66-7	LCSD Azobenzene <i>1,2</i> -Diphenylhydrazine	50.0	0.0	44.5	89	53-115	3	0-30
101-55-3	LCSD 4-Bromophenylphenylether	50.0	0.0	45.3	91	54-116	4	0-30
118-74-1	LCSD Hexachlorobenzene	50.0	0.0	44.3	89	54-115	7	0-30
87-86-5	LCSD Pentachlorophenol	50.0	0.0	59.0	118 *	41-116	3	0-30
85-01-8	LCSD Phenanthrene	50.0	0.0	46.6	93	55-110	8	0-30
120-12-7	LCSD Anthracene	50.0	0.0	46.2	92	56-112	8	0-30
84-74-2	LCSD Di-n-butylphthalate	50.0	0.0	51.4	103	57-123	8	0-30
206-44-0	LCSD Fluoranthene	50.0	0.0	52.7	105	54-118	13	0-30
129-00-0	LCSD Pyrene	50.0	0.0	52.3	105	49-121	0	0-30
85-68-7	LCSD Butylbenzylphthalate	50.0	0.0	52.2	104	52-125	4	0-30
117-81-7	LCSD bis(2-Ethylhexyl)phthalate	50.0	0.0	49.9	100	52-125	7	0-30
56-55-3	LCSD Benzo(a)anthracene	50.0	0.0	46.8	94	57-112	7	0-30
218-01-9	LCSD Chrysene	50.0	0.0	46.6	93	58-117	7	0-30
117-84-0	LCSD Di-n-octylphthalate	50.0	0.0	42.8	86	50-129	10	0-30
205-99-2	LCSD Benzo(b)fluoranthene	50.0	0.0	49.3	99	41-118	10	0-30
207-08-9	LCSD Benzo(k)fluoranthene	50.0	0.0	51.7	103	42-121	7	0-30
50-32-8	LCSD Benzo(a)pyrene	50.0	0.0	45.1	90	40-118	11	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2776

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1701046

Matrix: WATER

Lab Sample ID 1203877908

Instrument: MSD4.I

Analysis Date: 09/19/2017 19:05

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	50.0	0.0	38.4	77	34-125	18	0-30
53-70-3	LCSD Dibenzo(a,h)anthracene	50.0	0.0	39.0	78	38-129	17	0-30
191-24-2	LCSD Benzo(ghi)perylene	50.0	0.0	37.1	74	33-131	17	0-30
123-91-1	LCSD 1,4-Dioxane	50.0	0.0	38.7	77	38-78	2	0-30
930-55-2	LCSD N-Nitrosopyrrolidine	50.0	0.0	62.3	125 *	54-113	1	0-30
95-94-3	LCSD 1,2,4,5-Tetrachlorobenzene	50.0	0.0	36.9	74	44-102	8	0-30
1912-24-9	LCSD Atrazine	50.0	0.0	52.9	106	60-131	7	0-30
92-87-5	LCSD Benzidine	100	0.0	71.6	72	20-144	43 *	0-30
91-94-1	LCSD 3,3'-Dichlorobenzidine	50.0	0.0	46.9	94	43-127	11	0-30
120-82-1	LCSD 1,2,4-Trichlorobenzene	50.0	0.0	33.1	66	39-99	15	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike

Client ID: CAWA-17-142918MS

Matrix: W

Lab Sample ID 1203876072

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:29

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylam	116	0.00 U	84.5	73	25-106
110-86-1	MS Pyridine	116	0.00 U	82.4	71	24-93
62-53-3	MS Aniline	116	0.00 U	105	90	37-113
108-95-2	MS Phenol	116	0.00 U	77.1	66	23-82
111-44-4	MS bis(2-Chloroethyl) ether	116	0.00 U	106	91	39-114
95-57-8	MS 2-Chlorophenol	116	0.00 U	103	89	37-108
541-73-1	MS 1,3-Dichlorobenzene	116	0.00 U	75.9	65	27-97
106-46-7	MS 1,4-Dichlorobenzene	116	0.00 U	77.8	67	28-97
95-50-1	MS 1,2-Dichlorobenzene	116	0.00 U	82.5	71	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	116	0.00 U	110	95	32-127
100-51-6	MS Benzyl alcohol	116	0.00 U	105	90	37-116
95-48-7	MS o-Cresol	116	0.00 U	103	88	34-109
65794-96-9	MS m,p-Cresols	116	0.00 U	120	103	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00 U	127	109	42-118
67-72-1	MS Hexachloroethane	116	0.00 U	75.9	65	29-94
98-95-3	MS Nitrobenzene	116	0.00 U	103	89	38-123
78-59-1	MS Isophorone	116	0.00 U	111	96	43-120
88-75-5	MS 2-Nitrophenol	116	0.00 U	102	88	39-115
105-67-9	MS 2,4-Dimethylphenol	116	0.00 U	90.0	77	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	116	0.00 U	106	91	42-118
120-83-2	MS 2,4-Dichlorophenol	116	0.00 U	105	90	40-111
65-85-0	MS Benzoic acid	233	0.00 U	142	61	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike

Client ID: CAWA-17-142918MS

Matrix: W

Lab Sample ID 1203876072

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:29

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	116	0.00	U	124	107	44-138
87-68-3	MS	Hexachlorobutadiene	116	0.00	U	71.0	61	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00	U	129	111	41-122
91-57-6	MS	2-Methylnaphthalene	116	0.00	U	85.7	74	29-109
91-20-3	MS	Naphthalene	116	0.00	U	85.0	73	31-108
90-12-0	MS	1-Methylnaphthalene	116	0.00	U	88.2	76	33-112
77-47-4	MS	Hexachlorocyclopentadiene	116	0.00	U	47.6	41	26-79
88-06-2	MS	2,4,6-Trichlorophenol	116	0.00	U	106	91	39-124
95-95-4	MS	2,4,5-Trichlorophenol	116	0.00	U	122	105	42-120
91-58-7	MS	2-Chloronaphthalene	116	0.00	U	87.0	75	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	116	0.00	U	115	99	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	116	0.00	U	146	126	42-144
131-11-3	MS	Dimethylphthalate	116	0.00	U	112	97	45-128
606-20-2	MS	2,6-Dinitrotoluene	116	0.00	U	117	101	46-124
121-14-2	MS	2,4-Dinitrotoluene	116	0.00	U	131	113	45-125
208-96-8	MS	Acenaphthylene	116	0.00	U	97.9	84	35-120
83-32-9	MS	Acenaphthene	116	0.00	U	107	92	35-117
51-28-5	MS	2,4-Dinitrophenol	116	0.00	U	128	110	27-122
132-64-9	MS	Dibenzofuran	116	0.00	U	102	88	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	116	0.00	U	129	111	40-128
84-66-2	MS	Diethylphthalate	116	0.00	U	120	103	43-127
100-02-7	MS	4-Nitrophenol	116	0.00	U	82.6	71	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike

Client ID: CAWA-17-142918MS

Matrix: W

Lab Sample ID 1203876072

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:29

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	116	0.00	U	111	96	39-117
7005-72-3	MS	4-Chlorophenylphenylether	116	0.00	U	110	95	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	116	0.00	U	134	116	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	116	0.00	U	127	109	32-126
122-39-4	MS	Diphenylamine	116	0.00	U	95.9	82	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00	U	96.2	83	38-120
101-55-3	MS	4-Bromophenylphenylether	116	0.00	U	100	86	39-121
118-74-1	MS	Hexachlorobenzene	116	0.00	U	98.3	85	40-118
87-86-5	MS	Pentachlorophenol	116	0.00	U	144	124 *	35-121
85-01-8	MS	Phenanthrene	116	0.00	U	106	91	40-115
120-12-7	MS	Anthracene	116	0.00	U	106	92	38-120
84-74-2	MS	Di-n-butylphthalate	116	0.00	U	116	100	41-128
206-44-0	MS	Fluoranthene	116	0.00	U	129	111	41-119
129-00-0	MS	Pyrene	116	0.00	U	101	87	35-128
85-68-7	MS	Butylbenzylphthalate	116	0.00	U	107	92	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	116	0.00	U	101	87	38-131
56-55-3	MS	Benzo(a)anthracene	116	0.00	U	106	91	39-120
218-01-9	MS	Chrysene	116	0.00	U	104	89	41-124
117-84-0	MS	Di-n-octylphthalate	116	0.430	U	93.7	80	37-134
205-99-2	MS	Benzo(b)fluoranthene	116	0.00	U	113	97	31-122
207-08-9	MS	Benzo(k)fluoranthene	116	0.00	U	115	99	33-123
50-32-8	MS	Benzo(a)pyrene	116	0.00	U	101	87	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike

Client ID: CAWA-17-142918MS

Matrix: W

Lab Sample ID 1203876072

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:29

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	116	0.00 U	83.6	72	27-121
53-70-3	MS Dibenzo(a,h)anthracene	116	0.00 U	84.7	73	30-125
191-24-2	MS Benzo(ghi)perylene	116	0.00 U	79.6	68	24-126
123-91-1	MS 1,4-Dioxane	116	0.00 U	90.8	78	24-110
930-55-2	MS N-Nitrosopyrrolidine	116	0.00 U	120	103	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	116	0.00 U	87.7	75	32-101
1912-24-9	MS Atrazine	116	0.00 U	119	103	42-129
92-87-5	MS Benzidine	233	0.00 U	238	102	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	116	0.00 U	119	102	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	116	0.00 U	75.3	65	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142918MSD

Matrix: W

Lab Sample ID 1203876073

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:57

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylam	116	0.00	U	81.7	70	25-106	3	0-30
110-86-1	MSD Pyridine	116	0.00	U	62.2	53	24-93	28	0-30
62-53-3	MSD Aniline	116	0.00	U	102	88	37-113	3	0-30
108-95-2	MSD Phenol	116	0.00	U	77.3	67	23-82	0	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	116	0.00	U	106	91	39-114	0	0-30
95-57-8	MSD 2-Chlorophenol	116	0.00	U	104	90	37-108	1	0-30
541-73-1	MSD 1,3-Dichlorobenzene	116	0.00	U	72.8	63	27-97	4	0-30
106-46-7	MSD 1,4-Dichlorobenzene	116	0.00	U	74.9	64	28-97	4	0-30
95-50-1	MSD 1,2-Dichlorobenzene	116	0.00	U	78.8	68	28-99	5	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	116	0.00	U	106	91	32-127	4	0-30
100-51-6	MSD Benzyl alcohol	116	0.00	U	105	90	37-116	0	0-30
95-48-7	MSD o-Cresol	116	0.00	U	102	88	34-109	1	0-30
65794-96-9	MSD m,p-Cresols	116	0.00	U	120	103	36-120	0	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine N-Nitrosodipropylamine	116	0.00	U	124	107	42-118	2	0-30
67-72-1	MSD Hexachloroethane	116	0.00	U	72.1	62	29-94	5	0-30
98-95-3	MSD Nitrobenzene	116	0.00	U	99.5	86	38-123	4	0-30
78-59-1	MSD Isophorone	116	0.00	U	107	92	43-120	4	0-30
88-75-5	MSD 2-Nitrophenol	116	0.00	U	100	86	39-115	2	0-30
105-67-9	MSD 2,4-Dimethylphenol	116	0.00	U	88.4	76	39-107	2	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	116	0.00	U	103	88	42-118	3	0-30
120-83-2	MSD 2,4-Dichlorophenol	116	0.00	U	101	87	40-111	3	0-30
65-85-0	MSD Benzoic acid	233	0.00	U	150	64	17-95	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142918MSD

Matrix: W

Lab Sample ID 1203876073

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:57

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	116	0.00 U	125	107	44-138	0	0-30
87-68-3	MSD Hexachlorobutadiene	116	0.00 U	66.0	57	26-98	7	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00 U	128	110	41-122	1	0-30
91-57-6	MSD 2-Methylnaphthalene	116	0.00 U	81.5	70	29-109	5	0-30
91-20-3	MSD Naphthalene	116	0.00 U	80.1	69	31-108	6	0-30
90-12-0	MSD 1-Methylnaphthalene	116	0.00 U	85.2	73	33-112	3	0-30
77-47-4	MSD Hexachlorocyclopentadiene	116	0.00 U	42.5	37	26-79	11	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	116	0.00 U	99.2	85	39-124	7	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	116	0.00 U	115	99	42-120	5	0-30
91-58-7	MSD 2-Chloronaphthalene	116	0.00 U	79.3	68	29-113	9	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	116	0.00 U	109	94	41-121	5	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	116	0.00 U	142	122	42-144	3	0-30
131-11-3	MSD Dimethylphthalate	116	0.00 U	107	92	45-128	5	0-30
606-20-2	MSD 2,6-Dinitrotoluene	116	0.00 U	112	97	46-124	4	0-30
121-14-2	MSD 2,4-Dinitrotoluene	116	0.00 U	126	108	45-125	4	0-30
208-96-8	MSD Acenaphthylene	116	0.00 U	91.6	79	35-120	7	0-30
83-32-9	MSD Acenaphthene	116	0.00 U	98.6	85	35-117	8	0-30
51-28-5	MSD 2,4-Dinitrophenol	116	0.00 U	132	113	27-122	3	0-30
132-64-9	MSD Dibenzofuran	116	0.00 U	96.6	83	38-113	6	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	116	0.00 U	122	105	40-128	6	0-30
84-66-2	MSD Diethylphthalate	116	0.00 U	113	97	43-127	6	0-30
100-02-7	MSD 4-Nitrophenol	116	0.00 U	99.6	86 *	17-85	19	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142918MSD

Matrix: W

Lab Sample ID 1203876073

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:57

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	116	0.00 U	105	90	39-117	6	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	116	0.00 U	105	90	39-121	5	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	116	0.00 U	141	121	30-133	5	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	116	0.00 U	122	105	32-126	4	0-30
122-39-4	MSD Diphenylamine	116	0.00 U	89.0	77	37-118	8	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00 U	89.4	77	38-120	7	0-30
101-55-3	MSD 4-Bromophenylphenylether	116	0.00 U	91.8	79	39-121	9	0-30
118-74-1	MSD Hexachlorobenzene	116	0.00 U	90.3	78	40-118	9	0-30
87-86-5	MSD Pentachlorophenol	116	0.00 U	132	114	35-121	9	0-30
85-01-8	MSD Phenanthrene	116	0.00 U	97.7	84	40-115	8	0-30
120-12-7	MSD Anthracene	116	0.00 U	97.8	84	38-120	8	0-30
84-74-2	MSD Di-n-butylphthalate	116	0.00 U	105	90	41-128	10	0-30
206-44-0	MSD Fluoranthene	116	0.00 U	119	102	41-119	9	0-30
129-00-0	MSD Pyrene	116	0.00 U	101	87	35-128	0	0-30
85-68-7	MSD Butylbenzylphthalate	116	0.00 U	96.9	83	40-129	10	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	116	0.00 U	80.3	69	38-131	22	0-30
56-55-3	MSD Benzo(a)anthracene	116	0.00 U	98.8	85	39-120	7	0-30
218-01-9	MSD Chrysene	116	0.00 U	98.8	85	41-124	5	0-30
117-84-0	MSD Di-n-octylphthalate	116	0.430 U	71.8	61	37-134	26	0-30
205-99-2	MSD Benzo(b)fluoranthene	116	0.00 U	105	90	31-122	8	0-30
207-08-9	MSD Benzo(k)fluoranthene	116	0.00 U	108	93	33-123	6	0-30
50-32-8	MSD Benzo(a)pyrene	116	0.00 U	95.0	82	32-118	7	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-2776

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-142918MSD

Matrix: W

Lab Sample ID 1203876073

Instrument: MSD4.I

Analysis Date: 09/19/2017 20:57

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1701046

Inj. Vol: 1 uL

Batch ID: 1701047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	116	0.00	U	86.5	74	27-121	3	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	116	0.00	U	84.7	73	30-125	0	0-30
191-24-2	MSD Benzo(ghi)perylene	116	0.00	U	84.1	72	24-126	5	0-30
123-91-1	MSD 1,4-Dioxane	116	0.00	U	86.0	74	24-110	5	0-30
930-55-2	MSD N-Nitrosopyrrolidine	116	0.00	U	119	103	47-119	1	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	116	0.00	U	78.6	68	32-101	11	0-30
1912-24-9	MSD Atrazine	116	0.00	U	109	94	42-129	9	0-30
92-87-5	MSD Benzidine	233	0.00	U	178	77	15-130	29	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	116	0.00	U	109	94	34-124	9	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	116	0.00	U	69.7	60	26-102	8	0-30

Method Blank Summary

SDG Number:	2017-2776	Client:	ARSL004	Matrix:	WASTE WATER
Client ID:	MB for batch 1701046	Instrument ID:	MSD4.I	Data File:	s091917.B\s4i1908.D
Lab Sample ID:	1203876065	Prep Date:	09/19/2017 10:10	Analyzed:	09/19/17 18:10
Column:	DB-5ms				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1701046	1203876066	s091917.B\s4i1909.D	09/19/17	1838
02 LCSD for batch 1701046	1203877908	s091917.B\s4i1910.D	09/19/17	1905
03 CAWA-17-142918	432872003	s091917.B\s4i1912.D	09/19/17	2001
04 CAWA-17-142918MS	1203876072	s091917.B\s4i1913.D	09/19/17	2029
05 CAWA-17-142918MSD	1203876073	s091917.B\s4i1914.D	09/19/17	2057

Quality Control Data

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

Page 1 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203876065

Client Sample: QC for batch 1701046

Client ID: MB for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 18:10

Prep Date: 09/19/2017 10:10

Data File: s091917.B\s4i1908.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WASTE WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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

Page 2 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203876065

Client Sample: QC for batch 1701046

Client ID: MB for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 18:10

Prep Date: 09/19/2017 10:10

Data File: s091917.B\41908.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WASTE WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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

Page 3 of 3

SDG Number: 2017-2776	Matrix: WASTE WATER
Lab Sample ID: 1203876065	
Client Sample: QC for batch 1701046	Client: ARSL004
Client ID: MB for batch 1701046	Method: SW846 3510C/8270D
Batch ID: 1701047	Inst: MSD4.I
Run Date: 09/19/2017 18:10	Analyst: JMB3
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL
Data File: s091917.B\s4i1908.D	Column: DB-5ms
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	114	100	ug/L	114	(32%-124%)
2-Fluorobiphenyl	28.6	50.0	ug/L	57	(32%-112%)
2-Fluorophenol	63.3	100	ug/L	63	(15%-88%)
Nitrobenzene-d5	47.8	50.0	ug/L	96	(36%-115%)
Phenol-d5	39.4	100	ug/L	39	(15%-91%)
p-Terphenyl-d14	57.7	50.0	ug/L	115	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	1.789	7.53	ug/L	0	J
1000154-28-6	Cyclopentene, 1,2,3,4,5-pentamethy	4.131	4.12	ug/L	90	NJ

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

Page 1 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203876066

Client Sample: QC for batch 1701046

Client ID: LCS for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 18:38

Prep Date: 09/19/2017 10:10

Data File: s091917.B\s4i1909.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WASTE WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		39.9	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		38.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		45.5	ug/L	3.00	10.0
122-66-7	Azobenzene		45.9	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		42.7	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		43.8	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		39.4	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		42.6	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		58.3	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		55.8	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		48.9	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		52.3	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		45.1	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		50.5	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		60.9	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		55.2	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		38.8	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		61.9	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		55.1	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		41.5	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		51.3	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		52.2	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		47.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		61.6	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		63.7	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		50.9	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.6	ug/L	3.00	10.0
83-32-9	Acenaphthene		49.2	ug/L	0.300	1.00
208-96-8	Acenaphthylene		44.9	ug/L	0.300	1.00
62-53-3	Aniline		60.2	ug/L	4.20	10.0
120-12-7	Anthracene		50.3	ug/L	0.300	1.00
1912-24-9	Atrazine		56.9	ug/L	3.00	10.0
92-87-5	Benzidine		111	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		50.2	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		50.2	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		54.2	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		43.8	ug/L	0.300	1.00

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

Page 2 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203876066

Client Sample: QC for batch 1701046

Client ID: LCS for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 18:38

Prep Date: 09/19/2017 10:10

Data File: s091917.B\4i1909.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WASTE WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		55.2	ug/L	0.300	1.00
65-85-0	Benzoic acid		37.1	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		52.0	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		54.3	ug/L	3.00	10.0
218-01-9	Chrysene		50.2	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		55.9	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		47.4	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		46.3	ug/L	0.300	1.00
132-64-9	Dibenzofuran		47.7	ug/L	3.00	10.0
84-66-2	Diethylphthalate		56.6	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		52.8	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		45.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		59.9	ug/L	0.300	1.00
86-73-7	Fluorene		51.3	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		47.4	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		35.8	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.9	ug/L	3.00	10.0
67-72-1	Hexachloroethane		42.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		45.9	ug/L	0.300	1.00
78-59-1	Isophorone		55.7	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		35.5	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		71.6	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		63.1	ug/L	3.00	10.0
91-20-3	Naphthalene		42.0	ug/L	0.300	1.00
98-95-3	Nitrobenzene		51.4	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		60.7	ug/L	3.00	10.0
85-01-8	Phenanthrene		50.2	ug/L	0.300	1.00
108-95-2	Phenol		26.3	ug/L	3.00	10.0
129-00-0	Pyrene		52.1	ug/L	0.300	1.00
110-86-1	Pyridine		36.4	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		62.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		53.7	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		65.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		53.4	ug/L	3.00	10.0

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

Page 3 of 3

SDG Number: 2017-2776	Matrix: WASTE WATER
Lab Sample ID: 1203876066	
Client Sample: QC for batch 1701046	Client: ARSL004
Client ID: LCS for batch 1701046	Method: SW846 3510C/8270D
Batch ID: 1701047	Inst: MSD4.I
Run Date: 09/19/2017 18:38	Analyst: JMB3
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL
Data File: s091917.B\s4i1909.D	Column: DB-5ms
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		56.4	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		65.5	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		53.1	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		52.7	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		59.0	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	112	100	ug/L	112	(32%-124%)
2-Fluorobiphenyl	37.8	50.0	ug/L	76	(32%-112%)
2-Fluorophenol	74.4	100	ug/L	74	(15%-88%)
Nitrobenzene-d5	47.9	50.0	ug/L	96	(36%-115%)
Phenol-d5	46.4	100	ug/L	46	(15%-91%)
p-Terphenyl-d14	59.4	50.0	ug/L	119	(36%-121%)

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

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 1203876072	Date Received: 09/15/2017 08:55	
Client Sample: QC for batch 1701046	Client: ARSL004	Project: QC
Client ID: CAWA-17-142918MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:29	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1913.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		87.7	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		75.3	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		82.5	ug/L	6.98	23.3
122-66-7	Azobenzene		96.2	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		75.9	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		77.8	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		90.8	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		88.2	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		129	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		122	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		106	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		105	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		90.0	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		128	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		131	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		117	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		87.0	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		103	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		127	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		85.7	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		102	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		119	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		100	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		129	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		124	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		110	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		82.6	ug/L	6.98	23.3
83-32-9	Acenaphthene		107	ug/L	0.698	2.33
208-96-8	Acenaphthylene		97.9	ug/L	0.698	2.33
62-53-3	Aniline		105	ug/L	9.77	23.3
120-12-7	Anthracene		106	ug/L	0.698	2.33
1912-24-9	Atrazine		119	ug/L	6.98	23.3
92-87-5	Benzidine		238	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		106	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		101	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		113	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		79.6	ug/L	0.698	2.33

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

Page 2 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 1203876072	Date Received: 09/15/2017 08:55	
Client Sample: QC for batch 1701046	Client: ARSL004	Project: QC
Client ID: CAWA-17-142918MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:29	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s091917.B\41913.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		115	ug/L	0.698	2.33
65-85-0	Benzoic acid		142	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		105	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		107	ug/L	6.98	23.3
218-01-9	Chrysene		104	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		116	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		93.7	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		84.7	ug/L	0.698	2.33
132-64-9	Dibenzofuran		102	ug/L	6.98	23.3
84-66-2	Diethylphthalate		120	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		112	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		95.9	ug/L	6.98	23.3
206-44-0	Fluoranthene		129	ug/L	0.698	2.33
86-73-7	Fluorene		111	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		98.3	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		71.0	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		47.6	ug/L	6.98	23.3
67-72-1	Hexachloroethane		75.9	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		83.6	ug/L	0.698	2.33
78-59-1	Isophorone		111	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		84.5	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		127	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		120	ug/L	6.98	23.3
91-20-3	Naphthalene		85.0	ug/L	0.698	2.33
98-95-3	Nitrobenzene		103	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		144	ug/L	6.98	23.3
85-01-8	Phenanthrene		106	ug/L	0.698	2.33
108-95-2	Phenol		77.1	ug/L	6.98	23.3
129-00-0	Pyrene		101	ug/L	0.698	2.33
110-86-1	Pyridine		82.4	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		110	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		106	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		106	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		101	ug/L	6.98	23.3

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

Page 3 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 1203876072	Date Received: 09/15/2017 08:55	
Client Sample: QC for batch 1701046	Client: ARSL004	Project: QC
Client ID: CAWA-17-142918MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:29	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1913.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		120	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		146	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		103	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		115	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		134	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	271	233	ug/L	116	(32%-124%)
2-Fluorobiphenyl	83.9	116	ug/L	72	(32%-112%)
2-Fluorophenol	162	233	ug/L	70	(15%-88%)
Nitrobenzene-d5	91.5	116	ug/L	79	(36%-115%)
Phenol-d5	131	233	ug/L	56	(15%-91%)
p-Terphenyl-d14	112	116	ug/L	97	(36%-121%)

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

SDG Number:	2017-2776	Date Collected:	09/13/2017 10:44	Matrix:	W
Lab Sample ID:	1203876073	Date Received:	09/15/2017 08:55		
Client Sample:	QC for batch 1701046	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142918MSD	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1701047	Inst:	MSD4.I	Dilution:	1
Run Date:	09/19/2017 20:57	Analyst:	JMB3	Inj. Vol:	1 uL
Prep Date:	09/19/2017 10:10	Aliquot:	430 mL	Final Volume:	1 mL
Data File:	s091917.B\s4i1914.D	Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		78.6	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		69.7	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		78.8	ug/L	6.98	23.3
122-66-7	Azobenzene		89.4	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		72.8	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		74.9	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		86.0	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		85.2	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		122	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		115	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		99.2	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		101	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		88.4	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		132	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		126	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		112	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		79.3	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		104	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		122	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		81.5	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		100	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		109	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		91.8	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		128	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		125	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		105	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		99.6	ug/L	6.98	23.3
83-32-9	Acenaphthene		98.6	ug/L	0.698	2.33
208-96-8	Acenaphthylene		91.6	ug/L	0.698	2.33
62-53-3	Aniline		102	ug/L	9.77	23.3
120-12-7	Anthracene		97.8	ug/L	0.698	2.33
1912-24-9	Atrazine		109	ug/L	6.98	23.3
92-87-5	Benzidine		178	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		98.8	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		95.0	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		105	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		84.1	ug/L	0.698	2.33

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

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 1203876073	Date Received: 09/15/2017 08:55	
Client Sample: QC for batch 1701046	Client: ARSL004	Project: QC
Client ID: CAWA-17-142918MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:57	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s091917.B\41914.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		108	ug/L	0.698	2.33
65-85-0	Benzoic acid		150	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		105	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		96.9	ug/L	6.98	23.3
218-01-9	Chrysene		98.8	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		105	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		71.8	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		84.7	ug/L	0.698	2.33
132-64-9	Dibenzofuran		96.6	ug/L	6.98	23.3
84-66-2	Diethylphthalate		113	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		107	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		89.0	ug/L	6.98	23.3
206-44-0	Fluoranthene		119	ug/L	0.698	2.33
86-73-7	Fluorene		105	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		90.3	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		66.0	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		42.5	ug/L	6.98	23.3
67-72-1	Hexachloroethane		72.1	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		86.5	ug/L	0.698	2.33
78-59-1	Isophorone		107	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		81.7	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		124	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		119	ug/L	6.98	23.3
91-20-3	Naphthalene		80.1	ug/L	0.698	2.33
98-95-3	Nitrobenzene		99.5	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		132	ug/L	6.98	23.3
85-01-8	Phenanthrene		97.7	ug/L	0.698	2.33
108-95-2	Phenol		77.3	ug/L	6.98	23.3
129-00-0	Pyrene		101	ug/L	0.698	2.33
110-86-1	Pyridine		62.2	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		106	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		103	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		106	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		80.3	ug/L	6.98	23.3

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

Page 3 of 3

SDG Number: 2017-2776	Date Collected: 09/13/2017 10:44	Matrix: W
Lab Sample ID: 1203876073	Date Received: 09/15/2017 08:55	
Client Sample: QC for batch 1701046	Client: ARSL004	Project: QC
Client ID: CAWA-17-142918MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1701047	Inst: MSD4.I	Dilution: 1
Run Date: 09/19/2017 20:57	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 09/19/2017 10:10	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s091917.B\s4i1914.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		120	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		142	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		102	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		109	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		141	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	255	233	ug/L	110	(32%-124%)
2-Fluorobiphenyl	79.0	116	ug/L	68	(32%-112%)
2-Fluorophenol	166	233	ug/L	71	(15%-88%)
Nitrobenzene-d5	89.3	116	ug/L	77	(36%-115%)
Phenol-d5	136	233	ug/L	59	(15%-91%)
p-Terphenyl-d14	109	116	ug/L	94	(36%-121%)

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

Page 1 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203877908

Client Sample: QC for batch 1701046

Client ID: LCSD for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 19:05

Prep Date: 09/19/2017 10:10

Data File: s091917.B\s4i1910.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 1000 mL
Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		36.9	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		33.1	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		42.9	ug/L	3.00	10.0
122-66-7	Azobenzene		44.5	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		39.9	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		39.9	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		38.7	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		38.0	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		54.8	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		54.1	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		46.9	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		49.2	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		41.4	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		50.8	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		55.7	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		51.8	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		37.0	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		58.9	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		53.4	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		37.2	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		47.9	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		46.9	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		45.3	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		57.4	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		58.8	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		47.8	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.2	ug/L	3.00	10.0
83-32-9	Acenaphthene		46.1	ug/L	0.300	1.00
208-96-8	Acenaphthylene		42.2	ug/L	0.300	1.00
62-53-3	Aniline		59.5	ug/L	4.20	10.0
120-12-7	Anthracene		46.2	ug/L	0.300	1.00
1912-24-9	Atrazine		52.9	ug/L	3.00	10.0
92-87-5	Benzidine		71.6	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		46.8	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		45.1	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		49.3	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		37.1	ug/L	0.300	1.00

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

Page 2 of 3

SDG Number: 2017-2776

Lab Sample ID: 1203877908

Client Sample: QC for batch 1701046

Client ID: LCSD for batch 1701046

Batch ID: 1701047

Run Date: 09/19/2017 19:05

Prep Date: 09/19/2017 10:10

Data File: s091917.B\41910.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		51.7	ug/L	0.300	1.00
65-85-0	Benzoic acid		38.6	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		54.1	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		52.2	ug/L	3.00	10.0
218-01-9	Chrysene		46.6	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		51.4	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		42.8	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		39.0	ug/L	0.300	1.00
132-64-9	Dibenzofuran		44.8	ug/L	3.00	10.0
84-66-2	Diethylphthalate		52.2	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		49.6	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		44.3	ug/L	3.00	10.0
206-44-0	Fluoranthene		52.7	ug/L	0.300	1.00
86-73-7	Fluorene		47.9	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		44.3	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		31.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		18.4	ug/L	3.00	10.0
67-72-1	Hexachloroethane		39.8	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		38.4	ug/L	0.300	1.00
78-59-1	Isophorone		51.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		35.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine		70.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		62.3	ug/L	3.00	10.0
91-20-3	Naphthalene		37.1	ug/L	0.300	1.00
98-95-3	Nitrobenzene		47.1	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		59.0	ug/L	3.00	10.0
85-01-8	Phenanthrene		46.6	ug/L	0.300	1.00
108-95-2	Phenol		25.8	ug/L	3.00	10.0
129-00-0	Pyrene		52.3	ug/L	0.300	1.00
110-86-1	Pyridine		33.7	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		60.7	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		50.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		63.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		49.9	ug/L	3.00	10.0

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

Page 3 of 3

SDG Number: 2017-2776	Matrix: WATER
Lab Sample ID: 1203877908	
Client Sample: QC for batch 1701046	Client: ARSL004
Client ID: LCSD for batch 1701046	Method: SW846 3510C/8270D
Batch ID: 1701047	Inst: MSD4.I
Run Date: 09/19/2017 19:05	Analyst: JMB3
Prep Date: 09/19/2017 10:10	Aliquot: 1000 mL
Data File: s091917.B\s4i1910.D	Column: DB-5ms
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		55.8	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		61.9	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		52.0	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		50.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		52.7	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	116	100	ug/L	116	(32%-124%)
2-Fluorobiphenyl	33.9	50.0	ug/L	68	(32%-112%)
2-Fluorophenol	72.5	100	ug/L	72	(15%-88%)
Nitrobenzene-d5	43.9	50.0	ug/L	88	(36%-115%)
Phenol-d5	46.1	100	ug/L	46	(15%-91%)
p-Terphenyl-d14	59.3	50.0	ug/L	119	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2776
Work Order #: 432872**

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
432872001	432872001 (CAWA-17-142883)
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: 2017-2776 GEL Work Order: 432872

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 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-17-142883Date Received: 15-SEP-17GEL Job No (SDG): 2017-2776GEL Sample ID: 432872001Date 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	0.281	ug/L		1	20-SEP-17 21:12	per0920027a
	Perchlorate Isotope Ratio			2.88			1	20-SEP-17 21:12	per0920027a
14797-73-0	Perchlorate-101	.05	.2	0.277	ug/L		1	20-SEP-17 21:12	per0920027a
	Perchlorate-O(18)			0.482	ug/L		1	20-SEP-17 21:12	per0920027a

^ 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): 2017-2776

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): 2017-2776

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): 2017-2776GEL 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): 2017-2776GEL 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): 2017-2776GEL 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): 2017-2776GEL 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): 2017-2776GEL 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 #: 2017-2776
Work Order #: 432872**

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: 1701357

Prep Batch Number: 1701355

Sample Analysis

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

Sample ID	Client ID
432872002	CAWA-17-142918
1203876871	Method Blank (MB)
1203876872	Laboratory Control Sample (LCS)
1203876873	432723002(CAWA-17-142900) Matrix Spike (MS)
1203876874	432723002(CAWA-17-142900) 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 432723002 (CAWA-17-142900) 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 RPD values between the MS and MSD (See Below) were not within the acceptance limits. Since all other RPD values met acceptance criteria, the noted exceptions are attributed to vagaries in the extraction process. The data are reported.

Sample	Analyte	Value
1203876873MS and 1203876874MSD (CAWA-17-142900)	Nitrobenzene	31* (0%-30%)

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

The LC-MS/MS Explosives analysis was performed on a ABSciex 5500 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: 2017-2776 GEL Work Order: 432872

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 26 SEP 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142918

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 432872002

Sample Amount 920 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919022.wiff

Date Analyzed: 20-SEP-17 10:30

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.087	U	0.087	0.272
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.087	U	0.087	0.272
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.087	U	0.087	0.272
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.087	U	0.087	0.272
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.087	U	0.087	0.272
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.087	U	0.087	0.272
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.087	U	0.087	0.272
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.087	U	0.087	0.543
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	.087	U	0.087	0.272
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.087	U	0.087	0.272
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.087	U	0.087	0.272
<i>80251-29-2</i>	<i>DNX</i>				
98-95-3	Nitrobenzene	.087	U	0.087	0.272
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.087	U	0.087	0.272
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142918

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 432872002

Sample Amount 920 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-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	.087	U	0.087	0.272
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.087	U	0.087	0.272
99-65-0	m-Dinitrobenzene				
88-72-2	o-Nitrotoluene	.0891	U	0.0891	0.272
88-72-2	o-Nitrotoluene				
78-11-5	PETN	.109	U	0.109	0.543
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.163	U	0.163	0.543
99-99-0	p-Nitrotoluene				
3058-38-6	TATB	.326	U	0.326	1.09
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	.326	U	0.326	1.09
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	.326	U	0.326	1.09
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	.543	U	0.543	2.72
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	.543	U	0.543	2.72
6629-29-4	2,4-Diamino-6-nitrotoluene				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-2776**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
432872002	CAWA-17-142918	97	55 - 115	
1203876871	MB for batch 1701355	97	55 - 115	
1203876872	LCS for batch 1701355	98	55 - 115	
1203876873	CAWA-17-142900MS	96	55 - 115	
1203876874	CAWA-17-142900MSD	96	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) 2017-2776

Extract Batch Code: 1701355

Date Extracted: 19-SEP-17

GEL LCS ID: 1203876872

GEL LCSDUP ID: .

Analysis Date/Time: 20-SEP-17 07:32

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
RDX	5	4.44	89					64 - 117
TATB	1.25	1.52	122					47 - 135
TNX	.5	.426	85					51 - 110
Tetryl	5	5.02	100					55 - 122
m-Dinitrobenzene	5	4.87	97					74 - 117
m-Nitrotoluene	5	4.09	82					66 - 114
o-Nitrotoluene	5	4.31	86					64 - 115
p-Nitrotoluene	5	4.46	89					66 - 127
tris(o-cresyl) phosphate	5	2.75	55					43 - 104
2,4,6-Trinitrotoluene	5	4.78	96					69 - 113
2,4-Diamino-6-nitrotoluene	5	4.19	84					50 - 121
2,4-Dinitrotoluene	5	4.61	92					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.18	84					53 - 127
2,6-Dinitrotoluene	5	4.6	92					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.51	90					70 - 112
3,5-Dinitroaniline	5	4.4	88					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.64	93					74 - 116
DNX	.5	.459	92					65 - 113
1,3,5-Trinitrobenzene	5	4.75	95					70 - 110
HMX	5	4.18	84					58 - 113
MNX	.5	.442	88					66 - 114
Nitrobenzene	5	4.51	90					64 - 115
PETN	5	4.43	89					57 - 126

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-17-142900

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Extract Batch Code: 1701355

Date Extracted: 19-SEP-17

GEL Spike ID: 1203876873

GEL SpikeDup ID: 1203876874

Analysis Date/Time: 20-SEP-17 08:43

MSD Analysis Date/Time: 20-SEP-17 09:19

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
2,4,6-Trinitrotoluene	5.61798	0	5.57	99	5.33	95	4	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.61798	0	4.02	71	4.09	73	2	30	50 - 121
2,4-Dinitrotoluene	5.61798	0	4.99	89	5.08	90	2	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.61798	0	4.17	74	4.41	79	6	30	53 - 127
2,6-Dinitrotoluene	5.61798	0	5.16	92	5.09	91	1	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.61798	0	5	89	4.92	88	2	30	67 - 115
3,5-Dinitroaniline	5.61798	0	4.97	88	5.18	92	4	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.61798	0	5.39	96	5.14	92	5	30	65 - 120
DNX	.5618	0	.557	99	.505	90	10	30	53 - 124
HMX	5.61798	0	5.39	96	4.7	84	14	30	44 - 128
MXN	.5618	0	.561	100	.469	84	18	30	60 - 121
Nitrobenzene	5.61798	0	4.93	88	3.62	64	31 *	30	62 - 116
PETN	5.61798	0	4.98	89	4.65	83	7	30	51 - 131
RDX	5.61798	0	5.21	93	4.79	85	8	30	57 - 125
TATB	1.40449	0	1.84	131	1.64	117	11	30	38 - 149
TNX	.5618	0	.527	94	.503	90	5	30	46 - 120
Tetryl	5.61798	0	5.69	101	5.15	92	10	30	50 - 126
m-Dinitrobenzene	5.61798	0	5.97	106	5.5	98	8	30	74 - 117
m-Nitrotoluene	5.61798	0	4.63	82	4.52	80	2	30	59 - 120
o-Nitrotoluene	5.61798	0	4.77	85	4.59	82	4	30	56 - 119
p-Nitrotoluene	5.61798	0	5.13	91	4.67	83	10	30	61 - 129
tris(o-cresyl) phosphate	5.61798	0	3.72	66	2.85	51	26	30	38 - 105
1,3,5-Trinitrobenzene	5.61798	0	5.57	99	4.85	86	14	30	67 - 111

#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 1701355

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876871

Sample Amount 1000 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919016.wiff

Date Analyzed: 20-SEP-17 06:57

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 1701355

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876871

Sample Amount 1000 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-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 1701355

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876872

Sample Amount 1000 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919017.wiff

Date Analyzed: 20-SEP-17 07:32

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.426		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.442		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.459		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.52		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	2.75		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
99-08-1	m-Nitrotoluene	4.09		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
2691-41-0	HMX	4.18		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.18		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.19		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.31		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	4.4		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-11-5	PETN	4.43		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
121-82-4	RDX	4.44		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1701355

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876872

Sample Amount 1000 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	4.46		0.150	0.500
99-99-0	p-Nitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.51		0.080	0.250
35572-78-2	2-Amino-4,6-dinitrotoluene				
98-95-3	Nitrobenzene	4.51		0.080	0.250
98-95-3	Nitrobenzene				
606-20-2	2,6-Dinitrotoluene	4.6		0.080	0.250
606-20-2	2,6-Dinitrotoluene				
121-14-2	2,4-Dinitrotoluene	4.61		0.080	0.250
121-14-2	2,4-Dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.64		0.080	0.250
19406-51-0	4-Amino-2,6-dinitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	4.75		0.080	0.250
99-35-4	1,3,5-Trinitrobenzene				
118-96-7	2,4,6-Trinitrotoluene	4.78		0.080	0.250
118-96-7	2,4,6-Trinitrotoluene				
99-65-0	m-Dinitrobenzene	4.87		0.080	0.250
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	5.02		0.080	0.500
479-45-8	Tetryl				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142900(432723002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876873

Sample Amount 890 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919019.wiff

Date Analyzed: 20-SEP-17 08:43

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.527		0.0899	0.281
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.557		0.0899	0.281
<i>80251-29-2</i>	<i>DNX</i>				
5755-27-1	MNX	.561		0.0899	0.281
<i>5755-27-1</i>	<i>MNX</i>				
3058-38-6	TATB	1.84		0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.72		0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.02		0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.17		0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.63		0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.77		0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.93		0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
618-87-1	3,5-Dinitroaniline	4.97		0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-11-5	PETN	4.98		0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
121-14-2	2,4-Dinitrotoluene	4.99		0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142900(432723002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876873

Sample Amount 890 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	5		0.0899	0.281
35572-78-2	2-Amino-4,6-dinitrotoluene				
99-99-0	p-Nitrotoluene	5.13		0.169	0.562
99-99-0	p-Nitrotoluene				
606-20-2	2,6-Dinitrotoluene	5.16		0.0899	0.281
606-20-2	2,6-Dinitrotoluene				
121-82-4	RDX	5.21		0.0899	0.281
121-82-4	RDX				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.39		0.0899	0.281
19406-51-0	4-Amino-2,6-dinitrotoluene				
2691-41-0	HMX	5.39		0.0899	0.281
2691-41-0	HMX				
118-96-7	2,4,6-Trinitrotoluene	5.57		0.0899	0.281
118-96-7	2,4,6-Trinitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	5.57		0.0899	0.281
99-35-4	1,3,5-Trinitrobenzene				
479-45-8	Tetryl	5.69		0.0899	0.562
479-45-8	Tetryl				
99-65-0	m-Dinitrobenzene	5.97		0.0899	0.281
99-65-0	m-Dinitrobenzene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142900(432723002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876874

Sample Amount 890 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0919020.wiff

Date Analyzed: 20-SEP-17 09:19

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.469		0.0899	0.281
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.503		0.0899	0.281
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.505		0.0899	0.281
<i>80251-29-2</i>	<i>DNX</i>				
3058-38-6	TATB	1.64		0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	2.85		0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
98-95-3	Nitrobenzene	3.62		0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.09		0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.41		0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.52		0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.59		0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	4.65		0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.67		0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	4.7		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-17-142900(432723002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2776

Matrix: WATER

GEL Sample ID: 1203876874

Sample Amount 890 mL

Date Received: 15-SEP-17

Moisture: .

Extraction Batch ID: 1701355

Extraction Type Sol Exchange

Date Extracted: 19-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	4.79		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				
99-35-4	1,3,5-Trinitrobenzene	4.85		0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.92		0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.08		0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	5.09		0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.14		0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
479-45-8	Tetryl	5.15		0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
618-87-1	3,5-Dinitroaniline	5.18		0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
118-96-7	2,4,6-Trinitrotoluene	5.33		0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.5		0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2776Lab 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)
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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2776Lab 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)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	0
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
DNX	0	0
MNX	0	0
TNX	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2776

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)
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): 2017-2776

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)
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): 2017-2776

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)
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): 2017-2776

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)
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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2776
Work Order #: 432872

Sample ID	Client ID
432872001	CAWA-17-142883
432872002	CAWA-17-142918
1203876400	Method Blank (MB) ICP
1203876401	Laboratory Control Sample (LCS)
1203876404	432872001(CAWA-17-142883L) Serial Dilution (SD)
1203876402	432872001(CAWA-17-142883D) Sample Duplicate (DUP)
1203876403	432872001(CAWA-17-142883S) Matrix Spike (MS)
1203876320	Method Blank (MB) ICP-MS
1203876321	Laboratory Control Sample (LCS)
1203876324	432872001(CAWA-17-142883L) Serial Dilution (SD)
1203876322	432872001(CAWA-17-142883D) Sample Duplicate (DUP)
1203876323	432872001(CAWA-17-142883S) Matrix Spike (MS)
1203879599	Method Blank (MB) CVAA
1203879600	Laboratory Control Sample (LCS)
1203879611	432879003(NonSDGL) Serial Dilution (SD)
1203879607	432879003(NonSDGD) Sample Duplicate (DUP)
1203879609	432879003(NonSDGS) Matrix Spike (MS)

Sample Analysis

Samples 432872001 and 002 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1701155, 1701124, 1702521 and 1706554
Prep Batch :	1701154, 1701123 and 1702509
Standard Operating Procedures:	GL-MA-E-013 REV# 29, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 31, GL-MA-E-010 REV# 35 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 432872001 (CAWA-17-142883)-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: 432872001 (CAWA-17-142883)-ICP and ICP-MS and 432879003 (NonSDG)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. The relative percent differences (RPD) between the sample and its duplicate (DUP) were within acceptable limits for all applicable analytes.

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

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: 2017-2776 GEL Work Order: 432872

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: 12 OCT 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2776**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 432872001**BASIS:** As Received**DATE COLLECTED** 13-SEP-17**CLIENT ID:** CAWA-17-142883**LEVEL:** Low**DATE RECEIVED** 15-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	09/22/17 11:52	092217W1-4	1702521

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2776

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 432872001

BASIS: As Received

DATE COLLECTED 13-SEP-17

CLIENT ID: CAWA-17-142883

LEVEL: Low

DATE RECEIVED 15-SEP-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-39-3	Barium	12.5	ug/L		1	5	5	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-70-2	Calcium	9760	ug/L		50	200	200	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7439-95-4	Magnesium	2960	ug/L		110	300	300	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7439-98-7	Molybdenum	0.650	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/06/17 13:52	171006-3	1701124
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-09-7	Potassium	876	ug/L		50	150	150	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7631-86-9	Silica	54000	ug/L		53	213	213	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-23-5	Sodium	8050	ug/L		100	300	300	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-24-6	Strontium	44.8	ug/L		1	5	5	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-61-1	Uranium	0.382	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/06/17 09:56	171005-2	1701124
7440-62-2	Vanadium	2.07	ug/L	J	1	5	5	1	P	JWJ	09/19/17 20:21	091917-1	1701155
7440-66-6	Zinc	12.2	ug/L		3.3	10	10	1	P	JWJ	09/19/17 20:21	091917-1	1701155

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2776**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 432872001**BASIS:** As Received**DATE COLLECTED** 13-SEP-17**CLIENT ID:** CAWA-17-142883**LEVEL:** Low**DATE RECEIVED** 15-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	36.6	mg/L		0.453	1.24	1.24	1		TXT1	10/04/17 12:52		1706554

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1701124	1701123	SW846 3005A	50	mL	50	mL	09/19/17	SXW1
1701155	1701154	SW846 3005A	50	mL	50	mL	09/19/17	SXW1
1702521	1702509	EPA 245.1/245.2 Prep	20	mL	20	mL	09/21/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2776**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 432872002**BASIS:** As Received**DATE COLLECTED** 13-SEP-17**CLIENT ID:** CAWA-17-142918**LEVEL:** Low**DATE RECEIVED** 15-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	09/22/17 11:53	092217W1-4	1702521

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1702521	1702509	EPA 245.1/245.2 Prep	20	mL	20	mL	09/21/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2776

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>
1203876320	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.287	ug/L	+/-0.5	J	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203876400	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203879599	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. 2017-2776 Client ID: CAWA-17-142883S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 432872001 Spike ID: 1203876323

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	48		1	U	50	95		MS
Arsenic	ug/L	75-125	50.5		2	U	50	99.2		MS
Cadmium	ug/L	75-125	52.5		0.3	U	50	105		MS
Chromium	ug/L	75-125	50		3	U	50	97.7		MS
Lead	ug/L	75-125	51.2		0.5	U	50	102		MS
Molybdenum	ug/L	75-125	52.7		0.65		50	104		MS
Nickel	ug/L	75-125	50.6		0.6	U	50	101		MS
Selenium	ug/L	75-125	51.6		2	U	50	103		MS
Silver	ug/L	75-125	51		0.3	U	50	102		MS
Thallium	ug/L	75-125	49.4		0.6	U	50	98.7		MS
Uranium	ug/L	75-125	50.6		0.382		50	100		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2776 Client ID: CAWA-17-142883S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 432872001 Spike ID: 1203876403

<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	5030		68	U	5000	100		P
Barium	ug/L	75-125	501		12.5		500	97.6		P
Beryllium	ug/L	75-125	493		1	U	500	98.7		P
Boron	ug/L	75-125	505		15	U	500	98.7		P
Calcium	ug/L	75-125	14700		9760		5000	99.7		P
Cobalt	ug/L	75-125	497		1	U	500	99.3		P
Copper	ug/L	75-125	501		3	U	500	100		P
Iron	ug/L	75-125	5060		30	U	5000	101		P
Manganese	ug/L	75-125	489		2	U	500	97.7		P
Potassium	ug/L	75-125	5770		876		5000	97.9		P
Silica	ug/L		64300		54000		10700	96	N/A	P
Sodium	ug/L	75-125	12900		8050		5000	96.3		P
Strontium	ug/L	75-125	523		44.8		500	95.6		P
Tin	ug/L	75-125	475		2.5	U	500	95.1		P
Vanadium	ug/L	75-125	502		2.07	J	500	100		P
Zinc	ug/L	75-125	514		12.2		500	100		P
Magnesium	ug/L	75-125	8200		2960		5000	105		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2776 Client ID: WT_IPC-17-133234S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 432879003 Spike ID: 1203879609

<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	2.08		0.067	U	2	104		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2776

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142883D

Matrix: WATER

Level: Low

Sample ID: 432872001

Duplicate ID: 1203876322

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	0.65		0.715		9.52		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	0.382		0.351		8.46		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2776

Lab Code: GEL

Contract: ESHL00114

Client ID: CAWA-17-142883D

Matrix: WATER

Level: Low

Sample ID: 432872001

Duplicate ID: 1203876402

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	12.5		12.9		2.88		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	9760		9970		2.07		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	2960		3020		2.07		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	876		859		1.98		P
Silica	ug/L	+/-20%	54000		55900		3.53		P
Sodium	ug/L	+/-20%	8050		8280		2.87		P
Strontium	ug/L	+/-20%	44.8		46		2.49		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	2.07 J		2.25 J		8.44		P
Zinc	ug/L	+/-10	12.2		10.5		15.3		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2776**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** WT_IPC-17-133234D**Matrix:** WATER**Level:** Low**Sample ID:** 432879003**Duplicate ID:** 1203879607**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-2776

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>
1203876321								
	Antimony	ug/L	50	48		95.9	80-120	MS
	Arsenic	ug/L	50	51.4		103	80-120	MS
	Cadmium	ug/L	50	53.5		107	80-120	MS
	Chromium	ug/L	50	51.5		103	80-120	MS
	Lead	ug/L	50	51.7		103	80-120	MS
	Molybdenum	ug/L	50	51		102	80-120	MS
	Nickel	ug/L	50	53.8		108	80-120	MS
	Selenium	ug/L	50	51.9		104	80-120	MS
	Silver	ug/L	50	51.5		103	80-120	MS
	Thallium	ug/L	50	49.6		99.2	80-120	MS
	Uranium	ug/L	50	50.9		102	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-2776

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>
1203876401								
	Aluminum	ug/L	5000	5290		106	80-120	P
	Barium	ug/L	500	495		99	80-120	P
	Beryllium	ug/L	500	493		98.6	80-120	P
	Boron	ug/L	500	500		100	80-120	P
	Calcium	ug/L	5000	5260		105	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	499		99.9	80-120	P
	Iron	ug/L	5000	5210		104	80-120	P
	Magnesium	ug/L	5000	5330		107	80-120	P
	Manganese	ug/L	500	498		99.5	80-120	P
	Potassium	ug/L	5000	5140		103	80-120	P
	Silica	ug/L	10700	10000		93.4	80-120	P
	Sodium	ug/L	5000	5140		103	80-120	P
	Strontium	ug/L	500	504		101	80-120	P
	Tin	ug/L	500	486		97.2	80-120	P
	Vanadium	ug/L	500	503		101	80-120	P
	Zinc	ug/L	500	508		102	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-2776

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>
1203879600	Mercury	ug/L	2	2.05		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-2776 **Client ID:** CAWA-17-142883L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 432872001 **Serial Dilution ID:** 1203876324

<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	.65		1.06	J	62.308			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	.382		.345	J	9.686			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-2776 Client ID CAWA-17-142883L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 432872001 Serial Dilution ID: 1203876404

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	12.5		13.3	J	6.377			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	9760		9800		.404		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	2960		3090		4.597			P
Manganese	2	U	10	U				P
Potassium	876		750		14.384			P
Silica	54000		56600		4.863		10	P
Sodium	8050		8820		9.543		10	P
Strontium	44.8		48		7.047			P
Tin	2.5	U	12.5	U				P
Vanadium	2.07	J	5	U	139.164			P
Zinc	12.2		32.7	J	168.512			P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-2776 **Client ID:** WT_IPC-17-133234L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 432879003 **Serial Dilution ID:** 1203879611

<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 #: 2017-2776
Work Order #: 432872**

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
432872002	CAWA-17-142918
1203877657	Method Blank (MB)
1203877658	Laboratory Control Sample (LCS)
1203877659	432570002(CAWA-17-142891) Sample Duplicate (DUP)
1203877662	432570002(CAWA-17-142891) 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 432570002 (CAWA-17-142891) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1700910	Method:	WSP-CN(T)
Prep Batch :	1700909	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
432872002	CAWA-17-142918
1203875702	Method Blank (MB)
1203875703	Laboratory Control Sample (LCS)
1203876737	432872002(CAWA-17-142918) Sample Duplicate (DUP)
1203876738	432872002(CAWA-17-142918) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432872002 (CAWA-17-142918) 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:

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Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1703207 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
432872001	CAWA-17-142883
1203881300	Method Blank (MB)
1203881301	Laboratory Control Sample (LCS)
1203881302	432594004(CAWA-17-143050) Sample Duplicate (DUP)
1203881303	432594004(CAWA-17-143050) 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 432594004 (CAWA-17-143050) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203881302 (CAWA-17-143050DUP), 1203881303 (CAWA-17-143050PS) and 432872001 (CAWA-17-142883) 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:

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scanned and inserted into the electronic package.

Method/Analysis Information

Product:	Ammonia Nitrogen		
Analytical Batch:	1700465	Method:	NH3
Prep Batch :	1700464	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
432872001	CAWA-17-142883
1203874555	Method Blank (MB)
1203874556	Laboratory Control Sample (LCS)
1203874557	432570001(CAWA-17-142856) Sample Duplicate (DUP)
1203874558	432570001(CAWA-17-142856) 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 432570001 (CAWA-17-142856) 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

Samples 1203874555 (MB), 1203874556 (LCS), 1203874557 (CAWA-17-142856DUP) and 1203874558 (CAWA-17-142856MS) 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:

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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
432872002	CAWA-17-142918
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: 1701312

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
432872001	CAWA-17-142883
1203876756	Method Blank (MB)
1203876757	Laboratory Control Sample (LCS)
1203876760	432868001(CAWA-17-142884) Sample Duplicate (DUP)
1203876765	432868001(CAWA-17-142884) 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 432868001 (CAWA-17-142884) 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
432872001	CAWA-17-142883
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: 1700497

Method: TDS

Sample Analysis

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

Sample ID	Client ID
432872001	CAWA-17-142883
1203874646	Method Blank (MB)
1203874647	Laboratory Control Sample (LCS)
1203874648	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-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 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: 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
432872001	CAWA-17-142883
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: 1700639 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
432872001	CAWA-17-142883
1203875000	Laboratory Control Sample (LCS)
1203875001	432594004(CAWA-17-143050) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432594004 (CAWA-17-143050) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203875001 (CAWA-17-143050DUP)	pH	Received 13-SEP-17, out of holding 11-SEP-17
432872001 (CAWA-17-142883)	pH	Received 15-SEP-17, out of holding 13-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: 1700638 **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
432872001	CAWA-17-142883
1203874996	Laboratory Control Sample (LCS)
1203874998	432594004(CAWA-17-143050) Sample Duplicate (DUP)
1203874999	432594004(CAWA-17-143050) 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 432594004 (CAWA-17-143050) 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: 2017-2776 GEL Work Order: 432872


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: 10 OCT 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: October 10, 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: 2017-2776

Client Sample ID: CAWA-17-142883
Sample ID: 432872001
Matrix: W
Collect Date: 13-SEP-17 10:44
Receive Date: 15-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	09/23/17	0537	1703207	1
Chloride		1.38	0.067	0.200	mg/L		1					
Fluoride	J	0.0422	0.033	0.100	mg/L		1					
Sulfate		1.51	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	09/18/17	0926	1700465	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.393	0.017	0.050	mg/L		1	AXH3	09/19/17	0719	1701312	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.022	0.020	0.050	mg/L	1.00	1	KLP1	09/21/17	1434	1701314	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		101	3.40	14.3	mg/L			KLP1	09/18/17	1309	1700497	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		52.9	1.45	4.00	mg/L			RXB5	09/15/17	1550	1700638	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		115	1.00	1.00	umhos/cm		1	VH1	10/03/17	1243	1705527	7
PH "As Received"												
pH at Temp 16.1C	H	7.38	0.010	0.100	SU		1	RXB5	09/15/17	1548	1700639	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	09/18/17	0809	1700464
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 10, 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: 2017-2776

Client Sample ID: CAWA-17-142883
Sample ID: 432872001

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: October 10, 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: 2017-2776

Client Sample ID: CAWA-17-142918
Sample ID: 432872002
Matrix: W
Collect Date: 13-SEP-17 10:44
Receive Date: 15-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	J	0.425	0.330	1.00	mg/L		1	TSM	09/21/17	2319	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	1001	1700910	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	09/21/17	1653	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	0906	1700909
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 10, 2017

Page 1 of 6

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

Contact: Ms. Nita Patel

Workorder: 432872

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1701620										
QC1203877659	432570002	DUP									
Total Organic Carbon Average		2.81		2.83	mg/L	0.673	^	(+/-1.00)	TSM	09/21/17	17:27
QC1203877658	LCS										
Total Organic Carbon Average	10.0			10.0	mg/L			(80%-120%)		09/21/17	16:29
QC1203877657	MB										
Total Organic Carbon Average			U	ND	mg/L					09/21/17	16:17
QC1203877662	432570002	PS									
Total Organic Carbon Average	10.0	2.81		13.4	mg/L			(75%-125%)		09/21/17	18:14
Flow Injection Analysis											
Batch	1700910										
QC1203876737	432872002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	09/20/17	10:02
QC1203875703	LCS										
Cyanide, Total	50.0			48.8	ug/L			(90%-110%)		09/20/17	09:47
QC1203875702	MB										
Cyanide, Total			U	ND	ug/L					09/20/17	09:46
QC1203876738	432872002	MS									
Cyanide, Total	100	U	ND	103	ug/L			(90%-110%)		09/20/17	10:03
Ion Chromatography											
Batch	1703207										
QC1203881302	432594004	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	09/23/17	03:39

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QC Summary

Workorder: 432872

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1703207										
Chloride		1.08		1.07	mg/L	0.531		(0%-20%)	MXL2	09/23/17	03:39
Fluoride	J	0.0344	U	ND	mg/L	200	^				
Sulfate		2.25		2.22	mg/L	1.25		(0%-20%)			
QC1203881301	LCS										
Bromide	1.25			1.26	mg/L		101	(80%-120%)		09/23/17	02:40
Chloride	5.00			4.73	mg/L		94.5	(80%-120%)			
Fluoride	2.50			2.38	mg/L		95.1	(80%-120%)			
Sulfate	10.0			9.80	mg/L		98	(80%-120%)			
QC1203881300	MB										
Bromide			U	ND	mg/L					09/23/17	02:11
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203881303	432594004	PS									
Bromide	1.25	U	ND	1.26	mg/L		97.1	(75%-125%)		09/23/17	04:08
Chloride	5.00		1.08	5.86	mg/L		95.7	(75%-125%)			
Fluoride	2.50	J	0.0344	2.39	mg/L		94.2	(75%-125%)			
Sulfate	10.0		2.25	12.1	mg/L		98.7	(75%-125%)			

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QC Summary

Workorder: 432872

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1700465										
QC1203874557	432570001	DUP									
Nitrogen, Ammonia	J	0.0221	U	ND	mg/L	200	^		KLP1	09/18/17	09:01
QC1203874556	LCS										
Nitrogen, Ammonia	1.00			1.09	mg/L		109	(90%-110%)		09/18/17	08:59
QC1203874555	MB										
Nitrogen, Ammonia			U	ND	mg/L					09/18/17	08:58
QC1203874558	432570001	MS									
Nitrogen, Ammonia	1.00	J	0.0221	1.04	mg/L		102	(90%-110%)		09/18/17	09:02
Batch 1701312											
QC1203876760	432868001	DUP									
Nitrogen, Nitrate/Nitrite		0.417		0.411	mg/L	1.45		(0%-20%)	AXH3	09/19/17	07:11
QC1203876757	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.04	mg/L		104	(90%-110%)		09/19/17	07:02
QC1203876756	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					09/19/17	07:01
QC1203876765	432868001	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.417	1.44	mg/L		102	(90%-110%)		09/19/17	07:12
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

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QC Summary

Workorder: 432872

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1701314										
QC1203876773	432723001	MS									
Phosphorus, Total as P	1.00	0.256		1.38	mg/L		112	(63%-139%)	KLP1	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
Solids Analysis											
Batch	1700497										
QC1203874648	432594001	DUP									
Total Dissolved Solids		106		106	mg/L	1.36		(0%-5%)	KLP1	09/18/17	13:09
QC1203874647	LCS										
Total Dissolved Solids	300			289	mg/L		96.2	(95%-105%)		09/18/17	13:09
QC1203874646	MB										
Total Dissolved Solids			U	ND	mg/L					09/18/17	13:09
Titration and Ion Analysis											
Batch	1700638										
QC1203874998	432594004	DUP									
Alkalinity, Total as CaCO3		50.1		49.9	mg/L	0.399		(0%-20%)	RXB5	09/15/17	15:00
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					

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QC Summary

Workorder: 432872

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1700638										
QC1203874996	LCS										
Alkalinity, Total as CaCO3	100			106	mg/L		106	(90%-110%)	RXB5	09/15/17	14:46
QC1203874999	432594004	MS									
Alkalinity, Total as CaCO3	100	50.1		155	mg/L		105	(80%-120%)		09/15/17	15:01
Batch	1700639										
QC1203875001	432594004	DUP									
pH		H	7.67	H	7.68	SU	0.13	(0%-5%)	RXB5	09/15/17	14:58
QC1203875000	LCS										
pH	7.00			6.99	SU		99.9	(99%-101%)		09/15/17	14:46
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
- 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

GEL LABORATORIES LLC

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QC Summary

Workorder: 432872

Page 6 of 6

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