

The order of this data package is as follows:

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

Comments:

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAWA-17-142870

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/29/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1310		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PP	
LOCATION ID:	Martin Spring		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

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

SAMPLE COMMENTS: HE spot test yields negative results

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM Dissolved Oxygen _____ Flow (in gpm) _____
 Oxidation-Reduction Potential _____ TV 8-29-17 pH _____ Specific Conductance _____
 Temperature _____ Turbidity _____

COLLECTED BY (PRINT): W. Pryce

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/29/17 1430
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-17-142905

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8-29-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1310		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PP	
LOCATION ID:	Martin Spring		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS: HE spot test yields negative results

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1310	HH:MM	Dissolved Oxygen	7.34 mg/L	Flow (in gpm)	0.71
Oxidation-Reduction Potential	NA		pH	7.40	Specific Conductance	329.9 μ S/cm
Temperature	18.7		Turbidity	6.4 NTU		

COLLECTED BY (PRINT): W. Pryce

RELINQUISHED BY (Printed Name) (Signature)	Whitney Pryce	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) (Signature)	M. Martin	Date/Time 8/29/17 1430
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAPA-17-142931

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/29/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1035		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PP	
LOCATION ID:	Bulldog Spring		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS:

HE spot test yields negative results

LOCATION COMMENTS:

none

FIELD PARAMETERS:

Sample Time

HH:MM

COLLECTED BY (PRINT): W. Pryce

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/29/17 1430
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: CAPA-17-142933

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/29/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1035		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PP	
LOCATION ID:	Bulldog Spring		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

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

SAMPLE COMMENTS:

HE spot test yields negative results

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time

1035

HH:MM

pH = 7.68

Temp. = 13.7°C

Sp. Cond. = 251.4 μ S/cm

DO = 8.24 mg/L

Turbidity = 3.9 NTU

Q = 2.03 gpm

COLLECTED BY (PRINT): W. Pryce

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/29/17 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

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

SAMPLE ID: CAPA-17-143006

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	08/29/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1035		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	TV 8-29-17 PP DC	
LOCATION ID:	Bulldog Spring		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / <input checked="" type="radio"/> NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2 8/29/17 AV	HCL	Y	NA

SAMPLE COMMENTS: FTB received with custody seal broken, SMO personnel approved
Sample to use

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time TV 8-29-17 HH:MM

COLLECTED BY (PRINT): W. Pyce T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) Tanya Vander Vis	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) M. Montoya (Signature) [Signature]	Date/Time 8/29/17 1430
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-17-143013

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	8-29-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1310		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	Martin Spring		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 AS 8/29/17	HCL	Y	NA

SAMPLE COMMENTS: Broken custody seal as received, OK'd to use by SMO personnel

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Dissolved Oxygen	_____	Flow (in gpm)	_____
Oxidation-Reduction Potential	_____		pH ~ 8.29-17	_____	Specific Conductance	_____
Temperature	_____		Turbidity	_____		

COLLECTED BY (PRINT): T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) <i>Tanya Vander Vis</i>	Date/Time 8-29-17 1430	RECEIVED BY (Printed Name) <i>M. Morton</i> (Signature) <i>[Signature]</i>	Date/Time 8/29/17 1430
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

COC: 2017-2608

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 > 16 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			
Beta > 1,500 and < 100,000	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, or TA-39			
Beta > 1,500 and < 100,000	any location			
Alpha activity \geq 20,000 dpm/100cm ² and beta activity \geq 100,000 dpm/100cm ² and \geq 0.5 mR/hr on the external surface of the package.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , based on field screening measurements of alpha and beta activity.				

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.			X	
Activity (dpm/100cm ²)	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-55, 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 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 sufficient 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) Melissa M. M. M.	8/30/17 3:00
(Signature)	

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2608

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
431853	EPA:120.1	2				
431853	EPA:150.1	2				
431853	EPA:160.1	2				
431853	EPA:170.0	4		2		
431853	EPA:245.2	4				
431853	EPA:300.0	2				
431853	EPA:310.1	2				
431853	EPA:335.4	2				
431853	EPA:350.1	2				
431853	EPA:351.2	2				
431853	EPA:353.2	2				
431853	EPA:365.4	2				
431853	SM:A2340B	2				
431853	SW-846:6010C	2				
431853	SW-846:6020	2				
431853	SW-846:6850	2				
431853	SW-846:8260B	2		2		
431853	SW-846:8330B	2				
431853	SW-846:9060	2				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
431853	EPA:120.1	1701648	1701648	2										1			2				
431853	EPA:150.1	1697783	1697783	2										1			1				
431853	EPA:160.1	1698442	1698442	2					1					1			1				
431853	EPA:170.0	NA	NA	4		2															
431853	EPA:245.2	1700015	1700009	4					1	1				1			1				

DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
431853	EPA:300.0	1699852	1699852	2					1					1				1			
431853	EPA:310.1	1697772	1697772	2						1				1				1			
431853	EPA:335.4	1697077	1697076	2					1	1				1				1			
431853	EPA:350.1	1698259	1698258	2					1	1				1				1			
431853	EPA:351.2	1698267	1698266	2					1	1				1				1			
431853	EPA:353.2	1698270	1698270	2					1					1				1			
431853	EPA:365.4	1698269	1698268	2					1	1				1				1			
431853	SM:A2340B	1704101	1704101	2																	
431853	SW-846:6010C	1697417	1697416	2					1	1				1				1			
431853	SW-846:6020	1697444	1697443	2					1	1				1				1			
431853	SW-846:6850	1698696	1698687	2					1	1	1			1							
431853	SW-846:8260B	1698788	1698788	2		2			1					2							
431853	SW-846:8330B	1697813	1697811	2					1	1	1			1							
431853	SW-846:9060	1699093	1699093	2					1					1				2			

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPA-17-142931	1203877745	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142859	1203877746	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203877744	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-143049	1203867946	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203867945	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203869507	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203869506	MB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	WST35-17-144902	1203869510	DUP	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-17-142933	431853002	REG	1	0	0	0
EPA:170.0	VOC	CAPA-17-143006	431853003	FTB	1	0	0	0
EPA:170.0	VOC	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-142905	431853005	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-143013	431853006	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17-142933	431853002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142862	1203873379	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142862	1203873381	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-142905	431853005	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203873378	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203873377	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CrIN1-17-145287	1203872823	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203872822	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203872821	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-143049	1203867923	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-143049	1203867925	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203867919	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17-142933	431853002	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-142905	431853005	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203866147	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203866146	MB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WST35-17-144903	1203866970	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WST35-17-144903	1203866971	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203868980	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203868979	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST35-17-144903	1203868982	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WST35-17-144903	1203868984	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-142933	431853002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-142905	431853005	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203869000	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203868999	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
EPA:351.2	GENERAL CHEMISTRY	WST35-17-144903	1203869002	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	WST35-17-144903	1203869006	MS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203869020	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203869019	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	WST35-17-144903	1203869021	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-17-142931	431853001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-142870	431853004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203869010	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203869009	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST35-17-144903	1203869011	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST35-17-144903	1203869015	MS	0	0	1	0
SM:A2340B	INORGANIC	CAPA-17-142931	431853001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-142870	431853004	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-142931	431853001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-142870	431853004	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203867063	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203867062	MB	17	0	0	0
SW-846:6010C	INORGANIC	WST35-17-144902	1203867064	DUP	17	0	0	0
SW-846:6010C	INORGANIC	WST35-17-144902	1203867065	MS	0	0	17	0
SW-846:6020	INORGANIC	CAPA-17-142931	431853001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-142870	431853004	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203867121	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203867120	MB	11	0	0	0
SW-846:6020	INORGANIC	WST35-17-144902	1203867122	DUP	11	0	0	0
SW-846:6020	INORGANIC	WST35-17-144902	1203867123	MS	0	0	11	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870073	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	1203870074	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-142931	431853001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-142870	431853004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203870072	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203870071	MB	1	0	0	0
SW-846:8260B	VOC	CAPA-17-142933	431853002	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-17-143006	431853003	FTB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-142905	431853005	REG	80	3	0	0
SW-846:8260B	VOC	CAWA-17-143013	431853006	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203870313	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203870314	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203870312	MB	80	3	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8330B	LCMS/MS HIGH	CAPA-17-142933	1203868029	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAPA-17-142933	1203868030	MSD	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAPA-17-142933	431853002	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-142905	431853005	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203868028	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203868027	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17-142933	431853002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17-142934	1203871105	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-142905	431853005	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203871103	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203871102	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	WT_IPC-17-135360	1203871104	DUP	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203869009	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.036	J	mg/L	0.050
MB	1203871102	METHOD BLANK	SW-846:9060	W	Total Organic Carbon	0.673	J	mg/L	1.00
CAWA-17-143013	431853006	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	

DATA VALIDATION REPORT

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAPA-17-142931	1203869009	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.036	mg/L	0.0673		0.050	Y	5	100	Y
CAWA-17-142870	1203869009	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.036	mg/L	0.129		0.050	Y	5	100	Y
CAPA-17-142933	1203871102	METHOD BLANK	SW-846:9060	Total Organic Carbon	0.673	mg/L	1.85		1.00	Y	5	100	Y
CAWA-17-142905	1203871102	METHOD BLANK	SW-846:9060	Total Organic Carbon	0.673	mg/L	2.18		1.00	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
WST35-17-144903	1203869006		EPA:351.2	Total Kjeldahl Nitrogen	1698266	09-06-2017	W	128		110	90	10		
WST35-17-144902	1203867065		SW-846:6010C	Calcium	1697416	09-19-2017	W	141		125	75			
WST35-17-144902	1203867065		SW-846:6010C	Sodium	1697416	09-19-2017	W	127		125	75			

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

DATA VALIDATION REPORT

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
Bulldog Spring	2017-2608	CAPA-17-142931	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.0673	mg/L	0.0673	mg/L			W	08/29/2017		1698269	VAL	Y
Bulldog Spring	2017-2608	CAPA-17-142933	REG	INIT	GENERAL CHEMISTRY	SW-846:9060	Total Organic Carbon		U	I4	N	1.85	mg/L	1.85	mg/L			W	08/29/2017		1699093	VAL	Y
Martin Spring	2017-2608	CAWA-17-142870	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus		U	I4	N	0.129	mg/L	0.129	mg/L			W	08/29/2017		1698269	VAL	Y
Martin Spring	2017-2608	CAWA-17-142905	REG	INIT	GENERAL CHEMISTRY	SW-846:9060	Total Organic Carbon		U	I4	N	2.18	mg/L	2.18	mg/L			W	08/29/2017		1699093	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 qualify. The analyte is detected in the sample.

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-142931	Bulldog Spring	REG	EPA:120.1	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:150.1	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:160.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-142931	Bulldog Spring	REG	EPA:170.0	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:245.2	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:300.0	0	4
CAPA-17-142931	Bulldog Spring	REG	EPA:310.1	0	2
CAPA-17-142931	Bulldog Spring	REG	EPA:350.1	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:353.2	0	1
CAPA-17-142931	Bulldog Spring	REG	EPA:365.4	0	1
CAPA-17-142931	Bulldog Spring	REG	SM:A2340B	0	1
CAPA-17-142931	Bulldog Spring	REG	SW-846:6010C	0	17
CAPA-17-142931	Bulldog Spring	REG	SW-846:6020	0	11
CAPA-17-142931	Bulldog Spring	REG	SW-846:6850	0	1
CAPA-17-142933	Bulldog Spring	REG	EPA:170.0	0	1
CAPA-17-142933	Bulldog Spring	REG	EPA:245.2	0	1
CAPA-17-142933	Bulldog Spring	REG	EPA:335.4	0	1
CAPA-17-142933	Bulldog Spring	REG	EPA:351.2	0	1
CAPA-17-142933	Bulldog Spring	REG	SW-846:8260B	0	80
CAPA-17-142933	Bulldog Spring	REG	SW-846:8330B	0	20
CAPA-17-142933	Bulldog Spring	REG	SW-846:9060	0	1
CAPA-17-143006	Bulldog Spring	FTB	EPA:170.0	0	1
CAPA-17-143006	Bulldog Spring	FTB	SW-846:8260B	0	80
CAWA-17-142870	Martin Spring	REG	EPA:120.1	0	1
CAWA-17-142870	Martin Spring	REG	EPA:150.1	0	1
CAWA-17-142870	Martin Spring	REG	EPA:160.1	0	1
CAWA-17-142870	Martin Spring	REG	EPA:170.0	0	1
CAWA-17-142870	Martin Spring	REG	EPA:245.2	0	1
CAWA-17-142870	Martin Spring	REG	EPA:300.0	0	4
CAWA-17-142870	Martin Spring	REG	EPA:310.1	0	2
CAWA-17-142870	Martin Spring	REG	EPA:350.1	0	1
CAWA-17-142870	Martin Spring	REG	EPA:353.2	0	1
CAWA-17-142870	Martin Spring	REG	EPA:365.4	0	1
CAWA-17-142870	Martin Spring	REG	SM:A2340B	0	1
CAWA-17-142870	Martin Spring	REG	SW-846:6010C	0	17
CAWA-17-142870	Martin Spring	REG	SW-846:6020	0	11
CAWA-17-142870	Martin Spring	REG	SW-846:6850	0	1
CAWA-17-142905	Martin Spring	REG	EPA:170.0	0	1
CAWA-17-142905	Martin Spring	REG	EPA:245.2	0	1
CAWA-17-142905	Martin Spring	REG	EPA:335.4	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-142905	Martin Spring	REG	EPA:351.2	0	1
CAWA-17-142905	Martin Spring	REG	SW-846:8260B	0	80
CAWA-17-142905	Martin Spring	REG	SW-846:8330B	0	20
CAWA-17-142905	Martin Spring	REG	SW-846:9060	0	1
CAWA-17-143013	Martin Spring	FTB	EPA:170.0	0	1
CAWA-17-143013	Martin Spring	FTB	SW-846:8260B	0	80

September 27, 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: 431853
SDG: 2017-2608

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on August 31, 2017, and analyzed for Explosives by LCMSMS, GC/MS Volatile, General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Valerie Davis
Project Manager

Chain of Custody: 2017-2608
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 431853
SDG: 2017-2808

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 431853
SDG # : 2017-2608**

September 27, 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 August 31, 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). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
431853001	CAPA-17-142931
431853002	CAPA-17-142933
431853003	CAPA-17-143006
431853004	CAWA-17-142870
431853005	CAWA-17-142905
431853006	CAWA-17-143013

Case Narrative

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

Data Package

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

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

Valerie Davis

Valerie Davis
Project Manager

List of current GEL Certifications as of 26 September 2017

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

Chain of Custody and Supporting Documentation

COC: 2017-2608

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 > 16 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			
Beta > 1,500 and < 100,000	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, or TA-39			
Beta > 1,500 and < 100,000	any location			
Alpha activity ≥ 20,000 dpm/100cm ² and beta activity ≥ 100,000 dpm/100cm ² and ≥ 0.5 mR/hr on the external surface of the package.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910</i> , based on field screening measurements of alpha and beta activity.				

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.			X	
Activity (dpm/100cm ²)	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-55, 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 				
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 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 sufficient 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) <i>Melissa Mark</i>	<i>8/30/17 3:40</i>
(Signature) <i>[Signature]</i>	

LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30AUG17
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2916

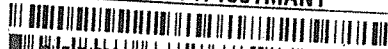
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 3N030ATT47100TMANT



FedEx
Express



J1513150813011V

3 of 3

MPS# 5908 1782 6571

Mstr# 5908 1782 6550

0201

X7 RBWA

29407
SC-US CHS

THU - 31 AUG 10:30A
PRIORITY OVERNIGHT

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: 30AUG17
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2916

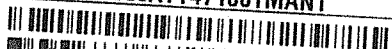
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 3N030ATT47100TMANT



FedEx
Express



J1513150813011V

1 of 3

TRK# 5908 1782 6550

MASTER

X7 RBWA

29407
SC-US CHS

THU - 31 AUG 10:30A
PRIORITY OVERNIGHT



LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 30AUG17
ACTWGT: 56.0 LB MAN
CAD: 0014176/CAFE2916

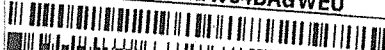
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



2 of 2

MPS# 5908 1782 6549

Mstr# 5908 1782 6538

0201

X7 RBWA

29407
SC-US CHS

THU - 31 AUG 10:30A
PRIORITY OVERNIGHT

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: 30AUG17
ACTWGT: 49.0 LB MAN
CAD: 0014176/CAFE2916

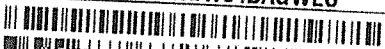
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

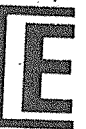
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Express



1 of 2

TRK# 5908 1782 6516

MASTER

X7 RBWA

2940
SC-US CH

THU - 31 AUG 10:30A
PRIORITY OVERNIGHT



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

SHIP DATE: 30AUG17
ACTWGT: 50.0 LB
CAD: 0014176/CAFE2916
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 3N030ATT47100TMANT



FedEx
Expre



2 of 3
MPS# 5908 1782 6560
0263
Mstr# 5908 1782 6560

THU - 31 AUG 10:30A
PRIORITY OVERNIGHT

0201

29407

SC-US CHS

X7 RBWA



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

SHIP DATE: 30AUG17
ACTWGT: 62.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

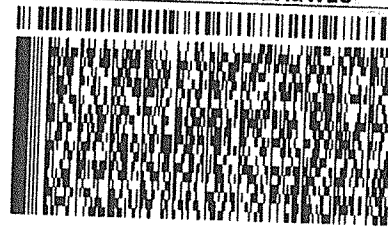
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Expre



2 of 2
MPS# 5908 1782 6527
0263
Mstr# 5908 1782 6516

THU - 31 AUG 10:30
PRIORITY OVERNIGHT

0201

2940

SC-US CH

X7 RBWA



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

SHIP DATE: 30AUG17
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PD0ASRGW04BAGWEO



FedEx
Expre



1 of 2
TRK# 5908 1782 6538
0201
MASTER

THU - 31 AUG 10:30
PRIORITY OVERNIGHT

X7 RBWA

29407

SC-US CHS





Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: ESHL		SDG/AR/COC/Work Order: 431853	
Received By: ZKW		Date Received: 8/31/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other	
		5908 1782 6550-2°C 5908 1782 6516-4°C 5908 1782 6571-2°C 5908 1782 6549-3°C 5908 1782 6560-2°C 5908 1782 6527-4°C 5908 1782 6538-2°C	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM/mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: _____	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius
4	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable): _____
5	Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: WST Samples rec'd unprocessed 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Sample ID's and containers affected: _____
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

AKH

Date

8/31/17

Page

of

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 #: 2017-2608
Work Order #: 431853**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1698788

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
431853002	CAPA-17-142933
431853003	CAPA-17-143006
431853005	CAWA-17-142905
431853006	CAWA-17-143013
1203870312	Method Blank (MB)
1203870313	Laboratory Control Sample (LCS)
1203870314	Laboratory Control Sample (LCS)
1203870315	431879002(CAWA-17-142897) Post Spike (PS)
1203870316	431879002(CAWA-17-142897) Post Spike (PS)
1203870317	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)
1203870318	431879002(CAWA-17-142897) Post Spike Duplicate (PSD)

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

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

SOP Reference

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

Calibration Information

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

Initial Calibration

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

Continuing Calibration Verification Requirements

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

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

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 431879002 (CAWA-17-142897) 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 431853002 (CAPA-17-142933), 431853003 (CAPA-17-143006), 431853005 (CAWA-17-142905) and 431853006 (CAWA-17-143013) 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
VOA1.I	Hewlett Packard 5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	RTX-624	Restek, 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: 2017-2608 GEL Work Order: 431853

The Qualifiers in this report are defined as follows:

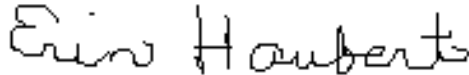
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- 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: 27 SEP 2017

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2608

Lab Sample ID: 431853002

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAPA-17-142933

Batch ID: 1698788

Run Date: 09/06/2017 13:15

Prep Date: 09/06/2017 13:15

Data File: 090617V1\1Y311.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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: 2017-2608

Lab Sample ID: 431853002

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 13:15

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 13:15

Data File: 090617V1\1Y311.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: 2017-2608

Lab Sample ID: 431853002

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 13:15

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 13:15

Data File: 090617V1\1Y311.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	59.6	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	48.2	50.0	ug/L 96	(70%-131%)
Toluene-d8	53.9	50.0	ug/L 108	(74%-124%)

Tentatively Identified Compound Summary

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2608

Lab Sample ID: 431853003

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAPA-17-143006

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 13:44

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 13:44

Data File: 090617V1\1Y312.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: 2017-2608

Lab Sample ID: 431853003

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAPA-17-143006

Batch ID: 1698788

Run Date: 09/06/2017 13:44

Prep Date: 09/06/2017 13:44

Data File: 090617V1\1Y312.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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: 2017-2608

Lab Sample ID: 431853003

Date Collected: 08/29/2017 10:35

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 13:44

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 13:44

Data File: 090617V1\1Y312.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	59.3	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	49.5	50.0	ug/L 99	(70%-131%)
Toluene-d8	53.0	50.0	ug/L 106	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608

Lab Sample ID: 431853005

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAWA-17-142905

Batch ID: 1698788

Run Date: 09/06/2017 14:13

Prep Date: 09/06/2017 14:13

Data File: 090617V1\1Y313.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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: 2017-2608

Lab Sample ID: 431853005

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAWA-17-142905

Batch ID: 1698788

Run Date: 09/06/2017 14:13

Prep Date: 09/06/2017 14:13

Data File: 090617V1\1Y313.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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: 2017-2608

Lab Sample ID: 431853005

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 14:13

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 14:13

Data File: 090617V1\1Y313.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	58.1	50.0	ug/L 116	(71%-134%)
Bromofluorobenzene	47.2	50.0	ug/L 94	(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	3.456	5.03	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2608

Lab Sample ID: 431853006

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAWA-17-143013

Batch ID: 1698788

Run Date: 09/06/2017 14:42

Prep Date: 09/06/2017 14:42

Data File: 090617V1\1Y314.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2017-2608

Lab Sample ID: 431853006

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client ID: CAWA-17-143013

Batch ID: 1698788

Run Date: 09/06/2017 14:42

Prep Date: 09/06/2017 14:42

Data File: 090617V1\1Y314.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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**

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SDG Number: 2017-2608

Lab Sample ID: 431853006

Date Collected: 08/29/2017 13:10

Date Received: 08/31/2017 08:45

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 14:42

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 14:42

Data File: 090617V1\1Y314.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	56.9	50.0	ug/L 114	(71%-134%)
Bromofluorobenzene	48.6	50.0	ug/L 97	(70%-131%)
Toluene-d8	51.8	50.0	ug/L 104	(74%-124%)

Tentatively Identified Compound Summary

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

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-2608**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203870313	LCS for batch 1698788	118	110	93
1203870314	LCS for batch 1698788	118	108	91
1203870312	MB for batch 1698788	119	109	98
431853002	CAPA-17-142933	119	108	96
431853003	CAPA-17-143006	119	106	99
431853005	CAWA-17-142905	116	104	94
431853006	CAWA-17-143013	114	104	97
1203870315	CAWA-17-142897PS	118	107	91
1203870317	CAWA-17-142897PSD	120	108	93
1203870316	CAWA-17-142897PS	119	107	90
1203870318	CAWA-17-142897PSD	117	105	91

Surrogate**Acceptance Limits**

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-2608

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	104	104	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1110	89	61-125
67-64-1	LCS Acetone	250	0.0	261	105	48-157
74-88-4	LCS Iodomethane	250	0.0	232	93	72-128
75-15-0	LCS Carbon disulfide	250	0.0	237	95	69-138
108-05-4	LCS Vinyl acetate	250	0.0	246	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	251	100	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	235	94	66-124
591-78-6	LCS 2-Hexanone	250	0.0	263	105	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	60.1	120	40-160
74-87-3	LCS Chloromethane	50.0	0.0	54.1	108	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	56.2	112	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.1	98	63-137
75-00-3	LCS Chloroethane	50.0	0.0	52.8	106	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	55.0	110	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.9	104	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.7	107	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	50.4	101	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	53.9	108	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	52.7	105	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	51.8	104	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	51.2	102	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-2608

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	58.0	116	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	48.6	97	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.1	100	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	54.5	109	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	53.5	107	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	53.5	107	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	47.3	95	74-122
71-43-2	LCS Benzene	50.0	0.0	48.9	98	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	52.7	105	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	48.4	97	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	47.5	95	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	50.3	101	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.1	106	78-131
108-88-3	LCS Toluene	50.0	0.0	50.7	101	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	57.6	115	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	49.6	99	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	49.4	99	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	52.4	105	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	53.0	106	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	52.8	106	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	50.0	100	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	52.0	104	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-2608

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	54.4	109	74-126
100-42-5	LCS Styrene	50.0	0.0	52.6	105	72-130
75-25-2	LCS Bromoform	50.0	0.0	53.6	107	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	57.6	115	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	50.1	100	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	52.4	105	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	50.4	101	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	53.3	107	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	55.2	110	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	53.9	108	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	52.1	104	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	61.0	122	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	54.9	110	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	57.2	114	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	58.1	116	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	48.8	98	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	48.4	97	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	57.5	115	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	47.5	95	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	55.1	110	72-136
91-20-3	LCS Naphthalene	50.0	0.0	54.5	109	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	58.5	117	70-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2608

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870313

Instrument: VOA1.I

Analysis Date: 09/06/2017 09:24

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	59.3	119	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	52.6	105	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	49.7	99	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4870	97	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-2608

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1698788

Matrix: WATER

Lab Sample ID 1203870314

Instrument: VOA1.I

Analysis Date: 09/06/2017 10:51

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	246	98	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	247	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	99	59-125
107-13-1	LCS Acrylonitrile	250	0.0	237	95	65-122
107-12-0	LCS Propionitrile	250	0.0	229	92	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	238	95	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	240	96	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	241	96	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2390	96	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	47.9	96	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-2608

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	94.3	94	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1120	89	56-131
67-64-1	PS Acetone	250	0.00 U	120	48	25-155
74-88-4	PS Iodomethane	250	0.00 U	227	91	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	216	86	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	232	93	48-133
78-93-3	PS 2-Butanone	250	0.00 U	152	61	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	222	89	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	181	72	33-138
127-18-4	PS Tetrachloroethylene	50.0	0.490 J	46.3	92	60-130
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	51.9	104	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	48.8	98	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.3	97	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	54.2	108	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	47.6	95	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.7	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	49.8	100	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	45.8	92	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.1	96	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	50.6	101	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	47.2	94	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	46.9	94	67-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-2608

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	48.9	98	69-127
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	47.8	96	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	48.6	97	71-130
67-66-3	PS Chloroform	50.0	0.00 U	47.4	95	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	48.2	96	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	46.3	93	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	48.7	97	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	47.9	96	69-130
71-43-2	PS Benzene	50.0	0.00 U	45.4	91	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	48.1	96	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	46.6	93	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	48.5	97	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	50.8	102	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	49.9	100	70-134
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	53.6	107	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	48.6	97	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	47.4	95	67-124
124-48-1	PS Dibromochloromethane	50.0	0.00 U	53.9	108	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	51.8	104	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	46.4	93	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	47.2	94	61-130
95-47-6	PS o-Xylene	50.0	0.00 U	50.7	101	62-131

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-2608

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	PS Styrene	50.0	0.00 U	49.9	100	59-135
75-25-2	PS Bromoform	50.0	0.00 U	54.7	109	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	50.1	100	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.7	97	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	51.3	103	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.5	97	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	47.5	95	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	49.6	99	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	49.4	99	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	47.6	95	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	53.8	108	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	50.6	101	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	51.1	102	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	52.9	106	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.8	94	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	46.0	92	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	52.0	104	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	49.8	100	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	51.8	104	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	54.4	109	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	57.4	115	52-135
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00 U	56.4	113	50-133

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2608

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870315

Instrument: VOA1.I

Analysis Date: 09/06/2017 18:34

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.1	104	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	48.4	97	60-125
108-88-3	PS Toluene	50.0	12.0	54.7	85	60-126
71-36-3	PS n-Butyl alcohol	5000	0.00 U	5000	100	60-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-2608

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00 U	95.4	95	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1100	88	56-131	2	0-20
67-64-1	PSD Acetone	250	0.00 U	120	48	25-155	0	0-20
74-88-4	PSD Iodomethane	250	0.00 U	228	91	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	217	87	61-141	0	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	232	93	48-133	0	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	152	61	25-143	0	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	224	90	61-127	1	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	183	73	33-138	1	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.490 J	47.3	94	60-130	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	51.8	104	33-164	0	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	48.7	97	53-139	0	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	49.9	100	58-140	3	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	54.2	108	59-146	0	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	47.7	95	65-129	0	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	48.3	97	65-141	1	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.9	102	69-127	2	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	46.7	93	59-130	2	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	49.4	99	62-123	3	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	51.6	103	69-132	2	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	47.9	96	65-127	2	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	48.2	96	67-127	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2608

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	U 49.8	100	69-127	2	0-20
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00	U 47.9	96	66-137	0	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 49.7	99	71-130	2	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 48.6	97	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 48.2	96	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 47.0	94	67-130	1	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 48.8	98	66-143	0	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 48.1	96	69-130	0	0-20
71-43-2	PSD Benzene	50.0	0.00	U 45.7	91	66-125	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 49.0	98	65-131	2	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 47.2	94	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 48.9	98	72-129	1	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 51.4	103	70-138	1	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 51.6	103	70-134	3	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 54.7	109	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 49.3	99	66-125	1	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 49.0	98	67-124	3	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 54.9	110	68-143	2	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 52.4	105	71-127	1	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 47.3	95	64-124	2	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 47.9	96	61-130	1	0-20
95-47-6	PSD o-Xylene	50.0	0.00	U 50.5	101	62-131	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-2608

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
100-42-5	PSD Styrene	50.0	0.00 U	49.8	100	59-135	0	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	55.8	112	64-138	2	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	51.1	102	55-133	2	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.6	99	62-129	2	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	52.0	104	70-124	1	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	48.9	98	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	47.7	95	50-133	0	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	50.1	100	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	49.2	98	56-128	0	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	47.5	95	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	53.8	108	55-135	0	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	50.1	100	53-132	1	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	50.9	102	50-138	0	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	52.2	104	49-138	1	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.0	92	56-126	2	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	46.0	92	55-125	0	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	50.8	102	43-142	2	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	49.4	99	62-141	1	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	50.8	102	40-147	2	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	55.1	110	62-134	1	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	57.1	114	52-135	1	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	55.8	112	50-133	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2017-2608

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870317

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:03

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.5	105	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	49.0	98	60-125	1	0-20
108-88-3	PSD Toluene	50.0	12.0	55.2	86	60-126	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4920	98	60-140	1	0-20

Volatile

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2017-2608

Sample Type: Post Spike

Client ID: CAWA-17-142897PS

Matrix: W

Lab Sample ID 1203870316

Instrument: VOA1.I

Analysis Date: 09/06/2017 19:32

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

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	239	96	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	240	96	57-149
107-05-1	PS Allyl chloride	250	0.00 U	240	96	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	243	97	59-129
107-12-0	PS Propionitrile	250	0.00 U	237	95	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	245	98	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	243	97	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	247	99	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2510	101	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	45.4	91	63-146

Volatile

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Quality Control Summary Spike Recovery Report

SDG Number: 2017-2608

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-142897PSD

Matrix: W

Lab Sample ID 1203870318

Instrument: VOA1.I

Analysis Date: 09/06/2017 20:01

Dilution: 1

Analyst: PXY1

Purge Vol: 5 mL

Batch ID: 1698788

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	235	94	49-141	2	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	234	94	57-149	3	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	233	93	54-128	3	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	239	96	59-129	2	0-20
107-12-0	PSD Propionitrile	250	0.00 U	231	92	58-131	3	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	239	96	59-134	2	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	242	97	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	242	97	60-136	2	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2470	99	60-143	2	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	44.2	88	63-146	3	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2017-2608	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1698788	Instrument ID:	VOA1.I	Data File:	090617V1\1Y307A.D
Lab Sample ID:	1203870312	Prep Date:	09/06/2017 11:20	Analyzed:	09/06/17 11:20
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 1698788	1203870313	090617V1\1Y303A.D	09/06/17	0924
02 LCS for batch 1698788	1203870314	090617V1\1Y306A.D	09/06/17	1051
03 CAPA-17-142933	431853002	090617V1\1Y311.D	09/06/17	1315
04 CAPA-17-143006	431853003	090617V1\1Y312.D	09/06/17	1344
05 CAWA-17-142905	431853005	090617V1\1Y313.D	09/06/17	1413
06 CAWA-17-143013	431853006	090617V1\1Y314.D	09/06/17	1442
07 CAWA-17-142897PS	1203870315	090617V1\1Y322.D	09/06/17	1834
08 CAWA-17-142897PSD	1203870317	090617V1\1Y323.D	09/06/17	1903
09 CAWA-17-142897PS	1203870316	090617V1\1Y324.D	09/06/17	1932
10 CAWA-17-142897PSD	1203870318	090617V1\1Y325.D	09/06/17	2001

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608

Lab Sample ID: 1203870312

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 11:20

Prep Date: 09/06/2017 11:20

Data File: 090617V1\1Y307A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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: 2017-2608

Lab Sample ID: 1203870312

Client Sample: QC for batch 1698788

Client ID: MB for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 11:20

Prep Date: 09/06/2017 11:20

Data File: 090617V1\1Y307A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2017-2608	Matrix:	WATER
Lab Sample ID:	1203870312		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	MB for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 11:20	Analyst:	PXY1
Prep Date:	09/06/2017 11:20		
Data File:	090617V1\1Y307A.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	59.7	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	48.9	50.0	ug/L 98	(70%-131%)
Toluene-d8	54.4	50.0	ug/L 109	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2017-2608

Lab Sample ID: 1203870313

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 09:24

Prep Date: 09/06/2017 09:24

Data File: 090617V1\1Y303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

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		52.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		54.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		51.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		53.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		58.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.4	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		59.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		54.9	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		47.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		48.4	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		55.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		48.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		48.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		58.0	ug/L	0.300	1.00
78-93-3	2-Butanone		251	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		53.9	ug/L	0.300	1.00
591-78-6	2-Hexanone		263	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		52.1	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		58.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		235	ug/L	1.50	5.00
67-64-1	Acetone		261	ug/L	1.50	10.0
75-05-8	Acetonitrile		1110	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		48.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		50.4	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		50.3	ug/L	0.300	1.00
75-25-2	Bromoform		53.6	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608

Lab Sample ID: 1203870313

Client Sample: QC for batch 1698788

Client ID: LCS for batch 1698788

Batch ID: 1698788

Run Date: 09/06/2017 09:24

Prep Date: 09/06/2017 09:24

Data File: 090617V1\1Y303A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA1.I

Analyst: PXY1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		49.1	ug/L	0.300	1.00
75-15-0	Carbon disulfide		237	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		53.5	ug/L	0.300	1.00
108-90-7	Chlorobenzene		50.0	ug/L	0.300	1.00
75-00-3	Chloroethane		52.8	ug/L	0.300	1.00
67-66-3	Chloroform		50.1	ug/L	0.300	1.00
74-87-3	Chloromethane		54.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.0	ug/L	0.300	1.00
74-95-3	Dibromomethane		47.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		60.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.0	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		55.1	ug/L	0.300	1.00
74-88-4	Iodomethane		232	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		57.6	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.4	ug/L	1.00	10.0
91-20-3	Naphthalene		54.5	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		52.4	ug/L	0.300	1.00
108-88-3	Toluene		50.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		52.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		55.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		246	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		51.2	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.1	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		4870	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		57.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		53.3	ug/L	0.300	1.00
95-47-6	o-Xylene		54.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		57.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

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SDG Number:	2017-2608	Matrix:	WATER
Lab Sample ID:	1203870313		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 09:24	Analyst:	PXY1
Prep Date:	09/06/2017 09:24		
Data File:	090617V1\1Y303A.D	Column:	DB-624
		Project:	QC
		SOP Ref:	GL-OA-E-038
		Dilution:	1
		Purge Vol:	5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		53.9	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		61.0	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		52.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		57.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.2	50.0	ug/L 118	(71%-134%)
Bromofluorobenzene	46.6	50.0	ug/L 93	(70%-131%)
Toluene-d8	54.8	50.0	ug/L 110	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608	Matrix: WATER
Lab Sample ID: 1203870314	
Client Sample: QC for batch 1698788	Client: ARSL004
Client ID: LCS for batch 1698788	Method: SW-846:8260B
Batch ID: 1698788	Inst: VOA1.I
Run Date: 09/06/2017 10:51	Analyst: PXY1
Prep Date: 09/06/2017 10:51	Purge Vol: 5 mL
Data File: 090617V1\1Y306A.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		47.9	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		246	ug/L	1.50	5.00
107-13-1	Acrylonitrile		237	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608

Matrix: WATER

Lab Sample ID: 1203870314

Client Sample: QC for batch 1698788

Client: ARSL004

Project: QC

Client ID: LCS for batch 1698788

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1698788

Inst: VOA1.I

Dilution: 1

Run Date: 09/06/2017 10:51

Analyst: PXY1

Purge Vol: 5 mL

Prep Date: 09/06/2017 10:51

Data File: 090617V1\1Y306A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		241	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2390	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		240	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		247	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:	2017-2608	Matrix:	WATER
Lab Sample ID:	1203870314		
Client Sample:	QC for batch 1698788	Client:	ARSL004
Client ID:	LCS for batch 1698788	Method:	SW-846:8260B
Batch ID:	1698788	Inst:	VOA1.I
Run Date:	09/06/2017 10:51	Analyst:	PXY1
Prep Date:	09/06/2017 10:51		
Data File:	090617V1\1Y306A.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	58.9	50.0	ug/L 118	(71%-134%)
Bromofluorobenzene	45.4	50.0	ug/L 91	(70%-131%)
Toluene-d8	53.9	50.0	ug/L 108	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.1	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		46.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		45.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		57.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		51.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		56.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.8	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		47.9	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		49.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		152	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		49.4	ug/L	0.300	1.00
591-78-6	2-Hexanone		181	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		52.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		222	ug/L	1.50	5.00
67-64-1	Acetone		120	ug/L	1.50	10.0
75-05-8	Acetonitrile		1120	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		45.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.6	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		50.8	ug/L	0.300	1.00
75-25-2	Bromoform		54.7	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		54.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		216	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		48.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		46.4	ug/L	0.300	1.00
75-00-3	Chloroethane		47.6	ug/L	0.300	1.00
67-66-3	Chloroform		47.4	ug/L	0.300	1.00
74-87-3	Chloromethane		48.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		53.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		51.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		49.8	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		51.8	ug/L	0.300	1.00
74-88-4	Iodomethane		227	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		50.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.1	ug/L	1.00	10.0
91-20-3	Naphthalene		54.4	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.9	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		46.3	ug/L	0.300	1.00
108-88-3	Toluene		54.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		232	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.3	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		48.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		94.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5000	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		52.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.5	ug/L	0.300	1.00
95-47-6	o-Xylene		50.7	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		51.1	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870315	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 18:34	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 18:34				
Data File:	090617V1\1Y322.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.2	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	59.0	50.0	ug/L 118	(71%-134%)
Bromofluorobenzene	45.3	50.0	ug/L 91	(70%-131%)
Toluene-d8	53.3	50.0	ug/L 107	(74%-124%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870316	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:32	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:32				
Data File:	090617V1\1Y324.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		45.4	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		239	ug/L	1.50	5.00
107-13-1	Acrylonitrile		243	ug/L	1.50	5.00
107-05-1	Allyl chloride		240	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:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870316	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:32	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:32				
Data File:	090617V1\1Y324.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		247	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		2510	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		245	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		243	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		237	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		240	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:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870316	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:32	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:32				
Data File:	090617V1\1Y324.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	59.6	50.0	ug/L 119	(71%-134%)
Bromofluorobenzene	44.9	50.0	ug/L 90	(70%-131%)
Toluene-d8	53.7	50.0	ug/L 107	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870317	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:03	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:03		
Data File: 090617V1\1Y323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.5	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.2	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		48.2	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		46.7	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		57.1	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		55.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.1	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		48.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		49.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.9	ug/L	0.300	1.00
78-93-3	2-Butanone		152	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		49.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		183	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		52.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		224	ug/L	1.50	5.00
67-64-1	Acetone		120	ug/L	1.50	10.0
75-05-8	Acetonitrile		1100	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		45.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.7	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.4	ug/L	0.300	1.00
75-25-2	Bromoform		55.8	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870317	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 19:03	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 19:03		
Data File: 090617V1\1Y323.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		54.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		217	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		48.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.3	ug/L	0.300	1.00
75-00-3	Chloroethane		47.7	ug/L	0.300	1.00
67-66-3	Chloroform		48.6	ug/L	0.300	1.00
74-87-3	Chloromethane		48.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		54.9	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.9	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		51.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		47.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		50.8	ug/L	0.300	1.00
74-88-4	Iodomethane		228	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.1	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		49.4	ug/L	1.00	10.0
91-20-3	Naphthalene		55.1	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		47.3	ug/L	0.300	1.00
108-88-3	Toluene		55.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		49.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		48.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		232	ug/L	1.50	5.00
75-01-4	Vinyl chloride		49.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.8	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		95.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4920	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		50.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.7	ug/L	0.300	1.00
95-47-6	o-Xylene		50.5	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		50.9	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870317	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 19:03	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 19:03				
Data File:	090617V1\1Y323.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		47.9	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	60.2	50.0	ug/L 120	(71%-134%)
Bromofluorobenzene	46.3	50.0	ug/L 93	(70%-131%)
Toluene-d8	54.2	50.0	ug/L 108	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2017-2608	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.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		44.2	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		235	ug/L	1.50	5.00
107-13-1	Acrylonitrile		239	ug/L	1.50	5.00
107-05-1	Allyl chloride		233	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: 2017-2608	Date Collected: 08/29/2017 15:05	Matrix: W
Lab Sample ID: 1203870318	Date Received: 08/31/2017 08:45	
Client Sample: QC for batch 1698788	Client: ARSL004	Project: QC
Client ID: CAWA-17-142897PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1698788	Inst: VOA1.I	Dilution: 1
Run Date: 09/06/2017 20:01	Analyst: PXY1	Purge Vol: 5 mL
Prep Date: 09/06/2017 20:01		
Data File: 090617V1\1Y325.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		242	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		2470	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		239	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		242	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		231	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		234	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:	2017-2608	Date Collected:	08/29/2017 15:05	Matrix:	W
Lab Sample ID:	1203870318	Date Received:	08/31/2017 08:45		
Client Sample:	QC for batch 1698788	Client:	ARSL004	Project:	QC
Client ID:	CAWA-17-142897PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1698788	Inst:	VOA1.I	Dilution:	1
Run Date:	09/06/2017 20:01	Analyst:	PXY1	Purge Vol:	5 mL
Prep Date:	09/06/2017 20:01				
Data File:	090617V1\1Y325.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	58.3	50.0	ug/L 117	(71%-134%)
Bromofluorobenzene	45.4	50.0	ug/L 91	(70%-131%)
Toluene-d8	52.3	50.0	ug/L 105	(74%-124%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2608
Work Order #: 431853**

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: 1698696

Prep Batch Number: 1698687

Sample Analysis

Sample ID	Client ID
431853001	431853001 (CAPA-17-142931)
431853004	431853004 (CAWA-17-142870)
1203870076	Interference Check Sample (ICS)
1203870071	Method Blank (MB)
1203870072	Laboratory Control Sample (LCS)
1203870073	431853001(CAPA-17-142931) Matrix Spike (MS)
1203870074	431853001(CAPA-17-142931) 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 431853001 (CAPA-17-142931) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

Sample 1203870073 (CAPA-17-142931MS) failed recovery for Perchlorate-101 at 133%. The acceptance range is from 75-125%. The failure of the MS was due to the background concentration of the parent sample, 431853001 (CAPA-17-142931). The LCS and MSD were within the acceptance range.

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

Some initial calibration standards, continuing calibration standards, and/or sample 1203870074 (CAPA-17-142931MSD) required manual integrations due to software limitations. The raw data for the manual integrations will be found with the raw data file.

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: 2017-2608 GEL Work Order: 431853

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 27 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931Date Received: 31-AUG-17GEL Job No (SDG): 2017-2608GEL Sample ID: 431853001Date Filtered: 06-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	0.750	ug/L		1	06-SEP-17 20:53	per0906028a
	Perchlorate Isotope Ratio			2.88			1	06-SEP-17 20:53	per0906028a
14797-73-0	Perchlorate-101	.05	.2	0.756	ug/L		1	06-SEP-17 20:53	per0906028a
	Perchlorate-O(18)			0.470	ug/L		1	06-SEP-17 20:53	per0906028a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-142870Date Received: 31-AUG-17GEL Job No (SDG): 2017-2608GEL Sample ID: 431853004Date Filtered: 06-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	0.496	ug/L		1	06-SEP-17 21:19	per0906031a
	Perchlorate Isotope Ratio			3.08			1	06-SEP-17 21:19	per0906031a
14797-73-0	Perchlorate-101	.05	.2	0.468	ug/L		1	06-SEP-17 21:19	per0906031a
	Perchlorate-O(18)			0.447	ug/L		1	06-SEP-17 21:19	per0906031a

^ 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): 2017-2608

Extract Batch Code: 1698687

Date Filtered: 06-SEP-17

Matrix: WATER

Sample ID: 1203870072

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	105		85 - 115
Perchlorate Isotope Ratio		2.8				-
Perchlorate-101	0.200	.219	ug/L	109		85 - 115
Perchlorate-O(18)		.455	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): 2017-2608

Extract Batch Code: 1698687

Date Extracted: 06-SEP-17

GEL MS/PS ID: 1203870073

Client ID: CAPA-17-142931

GEL MSD/PSD ID: 1203870074

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	0.750	ug/L	0.943	96	1	125	6	30	75 - 125
Perchlorate Isotope Ratio	0	2.88		2.68		2.89		8		-
Perchlorate-101	0.200	0.756	ug/L	1.02	133 *	1.01	125	2	30	75 - 125
Perchlorate-O(18)	0	0.470	ug/L	0.445		.45		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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 06-SEP-17GEL Job No (SDG): 2017-2608GEL Sample ID: 1203870071Date Filtered: 06-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	06-SEP-17 20:26	per0906025a
	Perchlorate Isotope Ratio						1	06-SEP-17 20:26	per0906025a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	06-SEP-17 20:26	per0906025a
	Perchlorate-O(18)			0.495	ug/L		1	06-SEP-17 20:26	per0906025a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 06-SEP-17GEL Job No (SDG): 2017-2608GEL Sample ID: 1203870072Date Filtered: 06-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	0.211	ug/L		1	06-SEP-17 20:35	per0906026a
	Perchlorate Isotope Ratio			2.8			1	06-SEP-17 20:35	per0906026a
14797-73-0	Perchlorate-101	.05	.2	0.219	ug/L		1	06-SEP-17 20:35	per0906026a
	Perchlorate-O(18)			0.455	ug/L		1	06-SEP-17 20:35	per0906026a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-2608GEL Sample ID: 1203870076Date Filtered: 06-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	0.242	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate Isotope Ratio			2.94			1	06-SEP-17 20:44	per0906027a
14797-73-0	Perchlorate-101	.05	.2	0.239	ug/L		1	06-SEP-17 20:44	per0906027a
	Perchlorate-O(18)			0.451	ug/L		1	06-SEP-17 20:44	per0906027a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDate Received: 31-AUG-17GEL Job No (SDG): 2017-2608GEL Sample ID: 1203870073Date Filtered: 06-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	0.943	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate Isotope Ratio			2.68			1	06-SEP-17 21:02	per0906029a
14797-73-0	Perchlorate-101	.05	.2	1.02	ug/L		1	06-SEP-17 21:02	per0906029a
	Perchlorate-O(18)			0.445	ug/L		1	06-SEP-17 21:02	per0906029a

^ 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: 1698687Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-142931MSDDate Received: 31-AUG-17GEL Job No (SDG): 2017-2608GEL Sample ID: 1203870074Date Filtered: 06-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	1.00	ug/L		1	06-SEP-17 21:11	per0906030a
	Perchlorate Isotope Ratio			2.89			1	06-SEP-17 21:11	per0906030a
14797-73-0	Perchlorate-101	.05	.2	1.01	ug/L		1	06-SEP-17 21:11	per0906030a
	Perchlorate-O(18)			0.450	ug/L		1	06-SEP-17 21:11	per0906030a

^ 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 #: 2017-2608
Work Order #: 431853**

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: 1697813

Prep Batch Number: 1697811

Sample Analysis

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

Sample ID	Client ID
431853002	CAPA-17-142933
431853005	CAWA-17-142905
1203868027	Method Blank (MB)
1203868028	Laboratory Control Sample (LCS)
1203868029	431853002(CAPA-17-142933) Matrix Spike (MS)
1203868030	431853002(CAPA-17-142933) 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 HMX 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 HMX was detected at concentrations exceeding the RL, the data are considered unaffected and 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 431853002 (CAPA-17-142933) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water. Sample 431853005 (CAWA-17-142905) was further diluted to bring the over range concentration within the calibration range. The final dilution in each case takes the 1:1 v/v dilution into account.

Analyte	431853
	005
RDX	25X

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: 2017-2608 GEL Work Order: 431853

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 27 SEP 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-142933

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 431853002

Sample Amount 890 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901035.wiff

Date Analyzed: 02-SEP-17 13:26

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.0899	U	0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.0899	U	0.0899	0.281
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.0899	U	0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
479-45-8	Tetryl	.0899	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	.0899	U	0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	.0899	U	0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.0899	U	0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.0899	U	0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.0899	U	0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0921	U	0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.112	U	0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.141	J	0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	.169	U	0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-142933

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 431853002

Sample Amount 890 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	.337	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.337	U	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.337	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.562	U	0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.562	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	2.9		0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	4.01		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142905

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 431853005

Sample Amount 870 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901038.wiff

Date Analyzed: 02-SEP-17 15:12

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.092	U	0.092	0.287
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.092	U	0.092	0.287
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
479-45-8	Tetryl	.092	U	0.092	0.575
<i>479-45-8</i>	<i>Tetryl</i>				
606-20-2	2,6-Dinitrotoluene	.092	U	0.092	0.287
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
98-95-3	Nitrobenzene	.092	U	0.092	0.287
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.092	U	0.092	0.287
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	.092	U	0.092	0.287
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.0943	U	0.0943	0.287
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
78-11-5	PETN	.115	U	0.115	0.575
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.172	U	0.172	0.575
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.3		0.092	0.287
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
3058-38-6	TATB	.345	U	0.345	1.15
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	.345	U	0.345	1.15
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142905

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 431853005

Sample Amount 870 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
59229-75-3	2,6-Diamino-4-nitrotoluene	.575	U	0.575	2.87
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.575	U	0.575	2.87
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	.66	J	0.345	1.15
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.85		0.092	0.287
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	1.03		0.092	0.287
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	10.8		0.092	0.287
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-142905

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 431853005

Sample Amount 870 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901050.wiff

Date Analyzed: 05-SEP-17 15:11

Dilution Factor: 25

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	61.1		1.15	3.59
121-82-4	RDX				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-2608**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
431853002	CAPA-17-142933	102	55 - 115	
431853005	CAWA-17-142905	94	55 - 115	
431853005	CAWA-17-142905DL	88	55 - 115	
1203868027	MB for batch 1697811	92	55 - 115	
1203868028	LCS for batch 1697811	89	55 - 115	
1203868029	CAPA-17-142933MS	91	55 - 115	
1203868030	CAPA-17-142933MSD	91	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Extract Batch Code: 1697811

Date Extracted: 01-SEP-17

GEL LCS ID: 1203868028

GEL LCSDUP ID: .

Analysis Date/Time: 02-SEP-17 12:50

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
p-Nitrotoluene	5	3.98	80					66 - 127
tris(o-cresyl) phosphate	5	2.6	52					43 - 104
1,3,5-Trinitrobenzene	5	4.44	89					70 - 110
2,4,6-Trinitrotoluene	5	4.64	93					69 - 113
2,4-Diamino-6-nitrotoluene	5	5.12	102					50 - 121
2,4-Dinitrotoluene	5	4.45	89					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.84	97					53 - 127
2,6-Dinitrotoluene	5	4.29	86					72 - 105
2-Amino-4,6-dinitrotoluene	5	3.87	77					70 - 112
3,5-Dinitroaniline	5	4.76	95					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.32	86					74 - 116
HMX	5	4	80					58 - 113
Nitrobenzene	5	4.91	98					64 - 115
PETN	5	4.35	87					57 - 126
RDX	5	4.22	84					64 - 117
TATB	2.5	2.13	85					47 - 135
Tetryl	5	5.02	100					55 - 122
m-Dinitrobenzene	5	4.8	96					74 - 117
m-Nitrotoluene	5	4.05	81					66 - 114
o-Nitrotoluene	5	4.06	81					64 - 115

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAPA-17-142933

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Extract Batch Code: 1697811

Date Extracted: 01-SEP-17

GEL Spike ID: 1203868029

GEL SpikeDup ID: 1203868030

Analysis Date/Time: 02-SEP-17 14:01

MSD Analysis Date/Time: 02-SEP-17 14:37

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
m-Nitrotoluene	5.61798	0	4.72	84	5.18	91	9	30	59 - 120
o-Nitrotoluene	5.61798	0	4.26	76	5.35	94	23	30	56 - 119
p-Nitrotoluene	5.61798	0	4.56	81	4.9	86	7	30	61 - 129
tris(o-cresyl) phosphate	5.61798	0	4.11	73	3.25	57	23	30	38 - 105
1,3,5-Trinitrobenzene	5.61798	0	4.66	83	4.77	84	2	30	67 - 111
2,4,6-Trinitrotoluene	5.61798	0	5.16	92	5.25	92	2	30	66 - 112
2,4-Diamino-6-nitrotoluene	5.61798	0	5.36	95	5.29	93	1	30	50 - 121
2,4-Dinitrotoluene	5.61798	0	4.98	89	5.28	93	6	30	69 - 113
2,6-Diamino-4-nitrotoluene	5.61798	0	5.27	94	5.85	103	10	30	53 - 127
2,6-Dinitrotoluene	5.61798	0	4.49	80	4.83	85	7	30	70 - 106
2-Amino-4,6-dinitrotoluene	5.61798	0	4.49	80	5.5	97	20	30	67 - 115
3,5-Dinitroaniline	5.61798	0	5.3	94	5.71	101	7	30	70 - 121
4-Amino-2,6-dinitrotoluene	5.61798	.141	5.02	87	5.18	89	3	30	65 - 120
HMX	5.61798	2.9	7.03	73	7.61	83	8	30	44 - 128
Nitrobenzene	5.61798	0	4.12	73	4.31	76	4	30	62 - 116
PETN	5.61798	0	4.58	82	5.12	90	11	30	51 - 131
RDX	5.61798	4.01	8.46	79	8.48	79	0	30	57 - 125
TATB	2.80899	0	2.32	83	2.41	85	4	30	38 - 149
Tetryl	5.61798	0	4.87	87	4.73	83	3	30	50 - 126
m-Dinitrobenzene	5.61798	0	4.96	88	5.18	91	4	30	74 - 117

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1697811

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868027

Sample Amount 1000 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901033.wiff

Date Analyzed: 02-SEP-17 12:15

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>				
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>				
606-20-2	2,6-Dinitrotoluene	.08	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</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>				
99-35-4	1,3,5-Trinitrobenzene	.08	U	0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.08	U	0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
88-72-2	o-Nitrotoluene	.082	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1697811

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868027

Sample Amount 1000 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	.1	U	0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.15	U	0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	.3	U	0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	.3	U	0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	.3	U	0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	.5	U	0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	.5	U	0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1697811

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868028

Sample Amount 1000 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901034.wiff

Date Analyzed: 02-SEP-17 12:50

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.13		0.300	1.00
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	2.6		0.300	1.00
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	3.87		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	3.98		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	4		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
99-08-1	m-Nitrotoluene	4.05		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.06		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	4.22		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
606-20-2	2,6-Dinitrotoluene	4.29		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.32		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
78-11-5	PETN	4.35		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-35-4	1,3,5-Trinitrobenzene	4.44		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.45		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1697811

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868028

Sample Amount 1000 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	4.64		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	4.76		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
99-65-0	m-Dinitrobenzene	4.8		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.84		0.500	2.50
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
98-95-3	Nitrobenzene	4.91		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
479-45-8	Tetryl	5.02		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.12		0.500	2.50
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-142933(431853002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868029

Sample Amount 890 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901036.wiff

Date Analyzed: 02-SEP-17 14:01

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.32		0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	4.11		0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
98-95-3	Nitrobenzene	4.12		0.0899	0.281
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.26		0.0921	0.281
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.49		0.0899	0.281
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.49		0.0899	0.281
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.56		0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
78-11-5	PETN	4.58		0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
99-35-4	1,3,5-Trinitrobenzene	4.66		0.0899	0.281
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.72		0.0899	0.281
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
479-45-8	Tetryl	4.87		0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
99-65-0	m-Dinitrobenzene	4.96		0.0899	0.281
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.98		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: CAPA-17-142933(431853002MS)MS

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868029

Sample Amount 890 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0	4-Amino-2,6-dinitrotoluene	5.02		0.0899	0.281
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.16		0.0899	0.281
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.27		0.562	2.81
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.3		0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.36		0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	7.03		0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	8.46		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-142933(431853002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868030

Sample Amount 880 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0901037.wiff

Date Analyzed: 02-SEP-17 14:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	2.41		0.341	1.14
<i>3058-38-6</i>	<i>TATB</i>				
78-30-8	tris(o-cresyl) phosphate	3.25		0.341	1.14
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
98-95-3	Nitrobenzene	4.31		0.0909	0.284
<i>98-95-3</i>	<i>Nitrobenzene</i>				
479-45-8	Tetryl	4.73		0.0909	0.568
<i>479-45-8</i>	<i>Tetryl</i>				
99-35-4	1,3,5-Trinitrobenzene	4.77		0.0909	0.284
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.83		0.0909	0.284
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.9		0.170	0.568
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
78-11-5	PETN	5.12		0.114	0.568
<i>78-11-5</i>	<i>PETN</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.18		0.0909	0.284
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	5.18		0.0909	0.284
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	5.18		0.0909	0.284
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	5.25		0.0909	0.284
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.28		0.0909	0.284
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-17-142933(431853002MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2017-2608

Matrix: WATER

GEL Sample ID: 1203868030

Sample Amount 880 mL

Date Received: 31-AUG-17

Moisture: .

Extraction Batch ID: 1697811

Extraction Type Sol Exchange

Date Extracted: 01-SEP-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
6629-29-4	2,4-Diamino-6-nitrotoluene	5.29		0.568	2.84
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
88-72-2	o-Nitrotoluene	5.35		0.0932	0.284
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.5		0.0909	0.284
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.71		0.341	1.14
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.85		0.568	2.84
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
2691-41-0	HMX	7.61		0.0909	0.284
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	8.48		0.0909	0.284
<i>121-82-4</i>	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2608Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 01-SEP-17 17:20GEL Data File: EXP0901001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-2608Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 01-SEP-17 17:55GEL Data File: EXP0901002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 01-SEP-17 22:39

GEL Data File: EXP0901010.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 02-SEP-17 01:01

GEL Data File: EXP0901014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 02-SEP-17 05:09

GEL Data File: EXP0901021.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 02-SEP-17 06:20

GEL Data File: EXP0901023.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 02-SEP-17 09:53

GEL Data File: EXP0901029.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 02-SEP-17 11:04

GEL Data File: EXP0901031.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 02-SEP-17 17:34

GEL Data File: EXP0901042.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	7.68
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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 02-SEP-17 18:45

GEL Data File: EXP0901044.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 05-SEP-17 12:47

GEL Data File: EXP0901046.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 05-SEP-17 13:58

GEL Data File: EXP0901048.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 05-SEP-17 17:33

GEL Data File: EXP0901054.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): 2017-2608

Lab Code: GEL

Lab Sample ID: XIBLK13

Analysis Date: 05-SEP-17 18:44

GEL Data File: EXP0901056.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-2608
Work Order #: 431853

Sample ID	Client ID
431853001	CAPA-17-142931
431853002	CAPA-17-142933
431853004	CAWA-17-142870
431853005	CAWA-17-142905
1203867062	Method Blank (MB) ICP
1203867063	Laboratory Control Sample (LCS)
1203867066	431851001(WST35-17-144902L) Serial Dilution (SD)
1203867064	431851001(WST35-17-144902D) Sample Duplicate (DUP)
1203867065	431851001(WST35-17-144902S) Matrix Spike (MS)
1203867120	Method Blank (MB) ICP-MS
1203867121	Laboratory Control Sample (LCS)
1203867124	431851001(WST35-17-144902L) Serial Dilution (SD)
1203867122	431851001(WST35-17-144902D) Sample Duplicate (DUP)
1203867123	431851001(WST35-17-144902S) Matrix Spike (MS)
1203873377	Method Blank (MB) CVAA
1203873378	Laboratory Control Sample (LCS)
1203873383	431879001(CAWA-17-142862L) Serial Dilution (SD)
1203873379	431879001(CAWA-17-142862D) Sample Duplicate (DUP)
1203873381	431879001(CAWA-17-142862S) Matrix Spike (MS)

Sample Analysis

Samples 431853001,002,004 and 005 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1697417, 1697444, 1700015 and 1704101
Prep Batch :	1697416, 1697443 and 1700009
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 CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 431851001 (WST35-17-144902)-ICP and ICP-MS and 431879001 (CAWA-17-142862)-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

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Not all the applicable analytes were within the established acceptance criteria. Matrix suppression may be suspected. The data has been qualified.

Analyte	Sample	Value
Sodium	1203867066 (WST35-17-144902SDILT)	10.7 *(0%-10%)

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: 2017-2608 GEL Work Order: 431853

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- E %difference of sample and SD is >10%. Sample concentration must meet flagging 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:

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 431853001**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAPA-17-142931**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	09/14/17 10:54	091417W1-9	1700015

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 431853001

BASIS: As Received

DATE COLLECTED 29-AUG-17

CLIENT ID: CAPA-17-142931

LEVEL: Low

DATE RECEIVED 31-AUG-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	312	ug/L		68	200	200	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	09/18/17 13:13	170918-3	1697444
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-39-3	Barium	68	ug/L		1	5	5	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-42-8	Boron	25.8	ug/L	J	15	50	50	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-70-2	Calcium	20700	ug/L		50	200	200	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7439-89-6	Iron	173	ug/L		30	100	100	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7439-95-4	Magnesium	5380	ug/L		110	300	300	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7439-98-7	Molybdenum	0.871	ug/L		0.2	0.5	0.5	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-09-7	Potassium	3200	ug/L		50	150	150	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7631-86-9	Silica	41400	ug/L		53	213	213	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-23-5	Sodium	21000	ug/L		100	300	300	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-24-6	Strontium	120	ug/L		1	5	5	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	09/15/17 20:13	170915-2	1697444
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-61-1	Uranium	0.297	ug/L		0.067	0.2	0.2	1	MS	BAJ	09/18/17 16:22	170918-8	1697444
7440-62-2	Vanadium	2.24	ug/L	J	1	5	5	1	P	JWJ	09/19/17 15:47	091917-1	1697417
7440-66-6	Zinc	4.96	ug/L	J	3.3	10	10	1	P	JWJ	09/19/17 15:47	091917-1	1697417

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 431853001**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAPA-17-142931**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	73.8	mg/L		0.453	1.24	1.24	1		TXT1	09/26/17 17:03		1704101

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1697417	1697416	SW846 3005A	50	mL	50	mL	09/01/17	EXF1
1697444	1697443	SW846 3005A	50	mL	50	mL	09/01/17	EXF1
1700015	1700009	EPA 245.1/245.2 Prep	20	mL	20	mL	09/13/17	AXS5

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 431853002**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAPA-17-142933**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	09/14/17 10:55	091417W1-9	1700015

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1700015	1700009	EPA 245.1/245.2 Prep	20	mL	20	mL	09/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 431853004**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAWA-17-142870**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	09/14/17 10:57	091417W1-9	1700015

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:** SW846**SAMPLE ID:** 431853004**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAWA-17-142870**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	780	ug/L		68	200	200	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	09/18/17 13:15	170918-3	1697444
7440-38-2	Arsenic	2.62	ug/L	J	2	5	5	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-39-3	Barium	141	ug/L		1	5	5	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-42-8	Boron	934	ug/L		15	50	50	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-70-2	Calcium	27100	ug/L		50	200	200	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7439-89-6	Iron	397	ug/L		30	100	100	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7439-95-4	Magnesium	6050	ug/L		110	300	300	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7439-96-5	Manganese	4.05	ug/L	J	2	10	10	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7439-98-7	Molybdenum	2.51	ug/L		0.2	0.5	0.5	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-09-7	Potassium	2880	ug/L		50	150	150	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7631-86-9	Silica	52200	ug/L		53	213	213	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-23-5	Sodium	30300	ug/L		100	300	300	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-24-6	Strontium	126	ug/L		1	5	5	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	09/15/17 20:17	170915-2	1697444
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-61-1	Uranium	1.31	ug/L		0.067	0.2	0.2	1	MS	BAJ	09/18/17 16:24	170918-8	1697444
7440-62-2	Vanadium	3.81	ug/L	J	1	5	5	1	P	JWJ	09/19/17 15:50	091917-1	1697417
7440-66-6	Zinc	7.31	ug/L	J	3.3	10	10	1	P	JWJ	09/19/17 15:50	091917-1	1697417

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 431853004**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAWA-17-142870**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	92.6	mg/L		0.453	1.24	1.24	1		TXT1	09/26/17 17:03		1704101

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1697417	1697416	SW846 3005A	50	mL	50	mL	09/01/17	EXF1
1697444	1697443	SW846 3005A	50	mL	50	mL	09/01/17	EXF1
1700015	1700009	EPA 245.1/245.2 Prep	20	mL	20	mL	09/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-2608**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 431853005**BASIS:** As Received**DATE COLLECTED** 29-AUG-17**CLIENT ID:** CAWA-17-142905**LEVEL:** Low**DATE RECEIVED** 31-AUG-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	09/14/17 10:59	091417W1-9	1700015

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1700015	1700009	EPA 245.1/245.2 Prep	20	mL	20	mL	09/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-2608

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>
1203867062	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Potassium	50	ug/L	+/-150	U	P	50	150
	Sodium	100	ug/L	+/-300	U	P	100	300
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Strontium	1	ug/L	+/-5	U	P	1	5
	Silica	53	ug/L	+/-213	U	P	53	213
	Manganese	2	ug/L	+/-10	U	P	2	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Calcium	50	ug/L	+/-200	U	P	50	200
1203867120	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203873377	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. 2017-2608 Client ID: WST35-17-144902S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 431851001 Spike ID: 1203867065

<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	5170		68	U	5000	103		P
Barium	ug/L	75-125	502		15.2		500	97.3		P
Beryllium	ug/L	75-125	490		1	U	500	97.9		P
Boron	ug/L		3200		2720		500	96.7	N/A	P
Calcium	ug/L		58400		51300		5000	141	N/A	P
Cobalt	ug/L	75-125	496		1.06	J	500	99		P
Copper	ug/L	75-125	598		101		500	99.3		P
Iron	ug/L	75-125	5290		128		5000	103		P
Magnesium	ug/L	75-125	6140		958		5000	104		P
Manganese	ug/L	75-125	489		6.77	J	500	96.4		P
Potassium	ug/L	75-125	13500		8290		5000	104		P
Silica	ug/L	75-125	34200		24000		10700	96		P
Sodium	ug/L		43100		36800		5000	127	N/A	P
Strontium	ug/L	75-125	685		181		500	101		P
Tin	ug/L	75-125	485		2.5	U	500	96.8		P
Vanadium	ug/L	75-125	501		1.95	J	500	99.7		P
Zinc	ug/L	75-125	536		39.8		500	99.2		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2608 Client ID: WST35-17-144902S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 431851001 Spike ID: 1203867123

<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	55.7		4.04		50	103		MS
Arsenic	ug/L	75-125	56.7		4.67	J	50	104		MS
Cadmium	ug/L	75-125	50.2		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	51.1		3	U	50	99.9		MS
Lead	ug/L	75-125	49.2		0.5	U	50	97.4		MS
Molybdenum	ug/L	75-125	70.1		18		50	104		MS
Nickel	ug/L	75-125	67		15.6		50	103		MS
Selenium	ug/L	75-125	53.2		2	U	50	106		MS
Silver	ug/L	75-125	50.1		0.3	U	50	100		MS
Thallium	ug/L	75-125	47.8		0.6	U	50	95.5		MS
Uranium	ug/L	75-125	53		0.507		50	105		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-2608 Client ID CAWA-17-142862S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 431879001 Spike ID: 1203873381

<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	1.98		0.067	U	2	98.9		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2608

Lab Code: GEL

Contract: ESHL00114

Client ID: WST35-17-144902D

Matrix: WATER

Level: Low

Sample ID: 431851001

Duplicate ID: 1203867064

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	15.2		15.8		3.65		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-20%	2720		2750		1.12		P
Calcium	ug/L	+/-20%	51300		52600		2.59		P
Cobalt	ug/L		1.06 J		1 U		200		P
Copper	ug/L	+/-20%	101		103		1.42		P
Iron	ug/L	+/-100	128		137		6.64		P
Magnesium	ug/L	+/-300	958		994		3.69		P
Manganese	ug/L	+/-10	6.77 J		7.09 J		4.7		P
Potassium	ug/L	+/-20%	8290		8460		2.06		P
Silica	ug/L	+/-20%	24000		24800		3.25		P
Sodium	ug/L	+/-20%	36800		38000		3.26		P
Strontium	ug/L	+/-20%	181		187		3.29		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	1.95 J		1.97 J		.881		P
Zinc	ug/L	+/-10	39.8		38.9		2.21		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-2608

Lab Code: GEL

Contract: ESHL00114

Client ID: WST35-17-144902D

Matrix: WATER

Level: Low

Sample ID: 431851001

Duplicate ID: 1203867122

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L	+/-3	4.04		4.7		15.1		MS
Arsenic	ug/L	+/-5	4.67 J		5.27		12		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/-20%	18		17.7		1.83		MS
Nickel	ug/L	+/-20%	15.6		16.2		4.24		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	0.507		0.514		1.37		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2017–2608**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA–17–142862D**Matrix:** WATER**Level:** Low**Sample ID:** 431879001**Duplicate ID:** 1203873379**Percent Solids for Dup:** N/A

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

*Analytical Methods:
AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2608

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>
1203867063								
	Iron	ug/L	5000	5370		107	80-120	P
	Magnesium	ug/L	5000	5520		110	80-120	P
	Manganese	ug/L	500	508		102	80-120	P
	Potassium	ug/L	5000	5400		108	80-120	P
	Silica	ug/L	10700	10300		96	80-120	P
	Sodium	ug/L	5000	5250		105	80-120	P
	Strontium	ug/L	500	521		104	80-120	P
	Tin	ug/L	500	484		96.7	80-120	P
	Vanadium	ug/L	500	511		102	80-120	P
	Zinc	ug/L	500	507		101	80-120	P
	Aluminum	ug/L	5000	5450		109	80-120	P
	Barium	ug/L	500	515		103	80-120	P
	Beryllium	ug/L	500	508		102	80-120	P
	Boron	ug/L	500	506		101	80-120	P
	Calcium	ug/L	5000	5490		110	80-120	P
	Cobalt	ug/L	500	521		104	80-120	P
	Copper	ug/L	500	509		102	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2608

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>
1203867121								
	Antimony	ug/L	50	55.4		111	80-120	MS
	Arsenic	ug/L	50	54.5		109	80-120	MS
	Cadmium	ug/L	50	54.3		109	80-120	MS
	Chromium	ug/L	50	55		110	80-120	MS
	Lead	ug/L	50	53.5		107	80-120	MS
	Molybdenum	ug/L	50	54.3		109	80-120	MS
	Nickel	ug/L	50	56.7		113	80-120	MS
	Selenium	ug/L	50	54.6		109	80-120	MS
	Silver	ug/L	50	56.8		114	80-120	MS
	Thallium	ug/L	50	51.6		103	80-120	MS
	Uranium	ug/L	50	55.5		111	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-2608

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>
1203873378	Mercury	ug/L	2	2		99.9	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2608

Client ID: WST35-17-144902L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 431851001

Serial Dilution ID: 1203867066

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	15.2		16.1	J	6.044			P
Beryllium	1	U	5	U				P
Boron	2720		2870		5.525		10	P
Calcium	51300		54900		7.08		10	P
Cobalt	1.06	J	5	U	105.361			P
Copper	101		107		5.115			P
Iron	128		155	J	20.655			P
Magnesium	958		1050	J	9.151			P
Manganese	6.77	J	10	U	12.165			P
Potassium	8290		8680		4.665		10	P
Silica	24000		25500		6.545		10	P
Sodium	36800		40700		10.709	E	10	P
Strontium	181		196		8.325		10	P
Tin	2.5	U	12.5	U				P
Vanadium	1.95	J	5	U	21.753			P
Zinc	39.8		57		43.409			P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2608

Client ID: WST35-17-144902L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 431851001

Serial Dilution ID: 1203867124

<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	4.04		5	U	11.359			MS
Arsenic	4.67	J	10	U	11.706			MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	18		16.5		8.445			MS
Nickel	15.6		16.4		5.263			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.507		.5	J	1.381			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-2608 **Client ID:** CAWA-17-142862L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 431879001 **Serial Dilution ID:** 1203873383

<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 #: 2017-2608
Work Order #: 431853**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1699093

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
431853002	CAPA-17-142933
431853005	CAWA-17-142905
1203871102	Method Blank (MB)
1203871103	Laboratory Control Sample (LCS)
1203871104	431769002(NonSDG) Sample Duplicate (DUP)
1203871105	432105005(CAPA-17-142934) Sample Duplicate (DUP)
1203871107	431769002(NonSDG) Post Spike (PS)
1203871108	432105005(CAPA-17-142934) 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

Samples 431769002 (NonSDG) and 432105005 (CAPA-17-142934) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203871104 (Non SDG 431769002DUP) and 1203871107 (Non SDG 431769002PS) in this sample group were diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

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

Miscellaneous Information**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:	1697077	Method:	WSP-CN(T)
Prep Batch :	1697076	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
431853002	CAPA-17-142933
431853005	CAWA-17-142905
1203866146	Method Blank (MB)
1203866147	Laboratory Control Sample (LCS)
1203866970	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203866971	431850001(WST35-17-144903) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 431850001 (WST35-17-144903) 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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present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1699852

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203872821	Method Blank (MB)
1203872822	Laboratory Control Sample (LCS)
1203872823	432546001(CrIN1-17-145287) Sample Duplicate (DUP)
1203872824	432546001(CrIN1-17-145287) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 432546001 (CrIN1-17-145287) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 431853001 (CAPA-17-142931) and 431853004 (CAWA-17-142870) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	431853	
	001	004
Chloride	5X	5X

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203872823 (CrIN1-17-145287DUP), 1203872824 (CrIN1-17-145287PS), 431853001 (CAPA-17-142931) and 431853004 (CAWA-17-142870) 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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Method/Analysis Information

Product:	Ammonia Nitrogen		
Analytical Batch:	1698259	Method:	NH3
Prep Batch :	1698258	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
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203868979	Method Blank (MB)
1203868980	Laboratory Control Sample (LCS)
1203868982	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203868984	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1698267	Method:	TKN
Prep Batch :	1698266	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
431853002	CAPA-17-142933
431853005	CAWA-17-142905
1203868999	Method Blank (MB)
1203869000	Laboratory Control Sample (LCS)
1203869002	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203869006	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) 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	1203869006 (WST35-17-144903MS)	128* (90.0%-110.0%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1698270

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203869019	Method Blank (MB)
1203869020	Laboratory Control Sample (LCS)
1203869021	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203869024	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following sample 431853004 (CAWA-17-142870) was diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	431853
	004
Nitrogen, Nitrate/Nitrite	5X

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:	1698269	Method:	PO4
Prep Batch :	1698268	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
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203869009	Method Blank (MB)
1203869010	Laboratory Control Sample (LCS)
1203869011	431850001(WST35-17-144903) Sample Duplicate (DUP)
1203869015	431850001(WST35-17-144903) 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 431850001 (WST35-17-144903) 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: 1698442

Method: TDS

Sample Analysis

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

Sample ID	Client ID
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203869506	Method Blank (MB)
1203869507	Laboratory Control Sample (LCS)
1203869510	431851001(WST35-17-144902) 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 431851001 (WST35-17-144902) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Total Dissolved Solids	1203869510 (WST35-17-144902DUP)	5.66* (0%-5%)

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**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: 1701648

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
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203877744	Laboratory Control Sample (LCS)
1203877745	431853001(CAPA-17-142931) Sample Duplicate (DUP)
1203877746	432189001(CAWA-17-142859) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 431853001 (CAPA-17-142931) and 432189001 (CAWA-17-142859) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1697783 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203867945	Laboratory Control Sample (LCS)
1203867946	431879008(CAWA-17-143049) 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 431879008 (CAWA-17-143049) 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
1203867946 (CAWA-17-143049DUP)	pH	Received 31-AUG-17, out of holding 29-AUG-17
431853001 (CAPA-17-142931)	pH	Received 31-AUG-17, out of holding 29-AUG-17
431853004 (CAWA-17-142870)	pH	Received 31-AUG-17, out of holding 29-AUG-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: 1697772 **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
431853001	CAPA-17-142931
431853004	CAWA-17-142870
1203867919	Laboratory Control Sample (LCS)
1203867923	431879008(CAWA-17-143049) Sample Duplicate (DUP)
1203867925	431879008(CAWA-17-143049) 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 431879008 (CAWA-17-143049) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-2608 GEL Work Order: 431853

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:

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 27, 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: 2017-2608

Client Sample ID: CAPA-17-142931
Sample ID: 431853001
Matrix: W
Collect Date: 29-AUG-17 10:35
Receive Date: 31-AUG-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0675	0.067	0.200	mg/L		1	MXL2	09/12/17	1404	1699852	1
Fluoride		0.206	0.033	0.100	mg/L		1					
Sulfate		11.5	0.133	0.400	mg/L		1					
Chloride		19.2	0.335	1.00	mg/L		5	MXL2	09/13/17	2130	1699852	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0419	0.017	0.050	mg/L	1.00	1	KLP1	09/05/17	1053	1698259	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.922	0.017	0.050	mg/L		1	AXH3	09/05/17	1015	1698270	4
PO4 "As Received"												
Phosphorus, Total as P		0.0673	0.020	0.050	mg/L	1.00	1	KLP1	09/06/17	0821	1698269	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		171	3.40	14.3	mg/L			KLP1	09/05/17	1326	1698442	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		81.0	1.45	4.00	mg/L			RXB5	09/02/17	1836	1697772	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		267	1.00	1.00	umhos/cm		1	VH1	09/20/17	1507	1701648	8
PH "As Received"												
pH at Temp 17.9C	H	7.54	0.010	0.100	SU		1	RXB5	09/02/17	1838	1697783	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/05/17	0845	1698258
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	09/05/17	1230	1698268

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 27, 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: 2017-2608

Client Sample ID: CAPA-17-142931
Sample ID: 431853001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 27, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2017-2608

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-17-142933

Project: ESHL00114

Sample ID: 431853002

Client ID: ARSL004

Matrix: W

Collect Date: 29-AUG-17 10:35

Receive Date: 31-AUG-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		1.85	0.330	1.00	mg/L		1	TSM	09/12/17	2256	1699093	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/06/17	0913	1697077	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.142	0.033	0.100	mg/L	1.00	1	KLP1	09/06/17	1152	1698267	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/06/17	0828	1697076
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	09/05/17	1230	1698266

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 27, 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: 2017-2608

Client Sample ID: CAWA-17-142870
Sample ID: 431853004
Matrix: W
Collect Date: 29-AUG-17 13:10
Receive Date: 31-AUG-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0859	0.067	0.200	mg/L		1	MXL2	09/12/17	1433	1699852	1
Fluoride		0.400	0.033	0.100	mg/L		1					
Sulfate		14.4	0.133	0.400	mg/L		1					
Chloride		20.5	0.335	1.00	mg/L		5	MXL2	09/13/17	2159	1699852	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0709	0.017	0.050	mg/L	1.00	1	KLP1	09/05/17	1054	1698259	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		2.53	0.085	0.250	mg/L		5	AXH3	09/05/17	1016	1698270	4
PO4 "As Received"												
Phosphorus, Total as P		0.129	0.020	0.050	mg/L	1.00	1	KLP1	09/06/17	0822	1698269	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		237	3.40	14.3	mg/L			KLP1	09/05/17	1326	1698442	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		105	1.45	4.00	mg/L			RXB5	09/02/17	1845	1697772	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		343	1.00	1.00	umhos/cm		1	VH1	09/20/17	1508	1701648	8
PH "As Received"												
pH at Temp 18.3C	H	7.27	0.010	0.100	SU		1	RXB5	09/02/17	1839	1697783	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	09/05/17	0845	1698258
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	09/05/17	1230	1698268

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Certificate of Analysis

Report Date: September 27, 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: 2017-2608

Client Sample ID: CAWA-17-142870
Sample ID: 431853004

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 27, 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: 2017-2608

Client Sample ID: CAWA-17-142905
Sample ID: 431853005
Matrix: W
Collect Date: 29-AUG-17 13:10
Receive Date: 31-AUG-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		2.18	0.330	1.00	mg/L		1	TSM	09/13/17	0006	1699093	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	09/06/17	0914	1697077	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.243	0.033	0.100	mg/L	1.00	1	KLP1	09/06/17	1152	1698267	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	09/06/17	0828	1697076
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	09/05/17	1230	1698266

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

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QC Summary

Report Date: September 27, 2017

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

Contact: Ms. Nita Patel

Workorder: 431853

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1699093										
QC1203871104	431769002	DUP									
Total Organic Carbon Average		12.1		11.8	mg/L	2.14		(0%-20%)	TSM	09/12/17	22:10
QC1203871105	432105005	DUP									
Total Organic Carbon Average	U	ND	U	ND	mg/L	N/A				09/13/17	08:43
QC1203871103	LCS										
Total Organic Carbon Average	10.0			10.4	mg/L		104	(80%-120%)		09/12/17	21:35
QC1203871102	MB										
Total Organic Carbon Average			J	0.673	mg/L					09/12/17	21:23
QC1203871107	431769002	PS									
Total Organic Carbon Average	10.0		6.05	16.5	mg/L		105	(75%-125%)		09/12/17	22:33
QC1203871108	432105005	PS									
Total Organic Carbon Average	10.0	U	ND	10.9	mg/L		105	(75%-125%)		09/13/17	09:30
Flow Injection Analysis											
Batch	1697077										
QC1203866970	431850001	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	09/06/17	09:06
QC1203866147	LCS										
Cyanide, Total	50.0			53.2	ug/L		106	(90%-110%)		09/06/17	08:46
QC1203866146	MB										
Cyanide, Total			U	ND	ug/L					09/06/17	08:45
QC1203866971	431850001	MS									
Cyanide, Total	100	U	ND	105	ug/L		105	(90%-110%)		09/06/17	09:07

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QC Summary

Workorder: 431853

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
QC1203872823	432546001	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	09/12/17	19:51
Chloride			6.99		6.98	mg/L	0.146	(0%-20%)			
Fluoride			0.290		0.294	mg/L	1.37 ^	(+/-0.100)			
Sulfate			9.17		9.19	mg/L	0.245	(0%-20%)			
QC1203872822	LCS										
Bromide	1.25				1.18	mg/L	94.1	(80%-120%)		09/12/17	13:35
Chloride	5.00				4.76	mg/L	95.2	(80%-120%)			
Fluoride	2.50				2.37	mg/L	94.7	(80%-120%)			
Sulfate	10.0				9.49	mg/L	94.9	(80%-120%)			
QC1203872821	MB										
Bromide			U		ND	mg/L				09/12/17	13:06
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203872824	432546001	PS									
Bromide	1.25	U	ND		1.28	mg/L	97.2	(75%-125%)		09/12/17	20:20
Chloride	5.00		6.99		12.5	mg/L	110	(75%-125%)			

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QC Summary

Workorder: 431853

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1699852										
Fluoride	2.50	0.290		2.67	mg/L		95.3	(75%-125%)	MXL2	09/12/17	20:20
Sulfate	10.0	9.17		19.7	mg/L		105	(75%-125%)			
Nutrient Analysis											
Batch	1698259										
QC1203868982	431850001	DUP									
Nitrogen, Ammonia		0.496		0.504	mg/L	1.6		(0%-20%)	KLP1	09/05/17	10:46
QC1203868980	LCS										
Nitrogen, Ammonia	1.00			0.918	mg/L		91.8	(90%-110%)		09/05/17	10:41
QC1203868979	MB										
Nitrogen, Ammonia			U	ND	mg/L					09/05/17	10:41
QC1203868984	431850001	MS									
Nitrogen, Ammonia	1.00	0.496		1.44	mg/L		94.4	(90%-110%)		09/05/17	10:47
Batch	1698267										
QC1203869002	431850001	DUP									
Nitrogen, Total Kjeldahl		1.57		1.60	mg/L	1.89		(0%-20%)	KLP1	09/06/17	11:45
QC1203869000	LCS										
Nitrogen, Total Kjeldahl	1.00			0.954	mg/L		95.4	(90%-110%)		09/06/17	11:40
QC1203868999	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					09/06/17	11:39
QC1203869006	431850001	MS									
Nitrogen, Total Kjeldahl	1.00	1.57		2.85	mg/L		128 *	(90%-110%)		09/06/17	11:46
Batch	1698269										
QC1203869011	431850001	DUP									
Phosphorus, Total as P		2.86		2.82	mg/L	1.41		(0%-27%)	KLP1	09/06/17	08:18

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QC Summary

Workorder: 431853

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1698269										
QC1203869010	LCS										
Phosphorus, Total as P	1.00			0.954	mg/L		95.4	(80%-124%)	KLP1	09/06/17	08:16
QC1203869009	MB										
Phosphorus, Total as P			J	0.036	mg/L					09/06/17	08:15
QC1203869015	431850001	MS									
Phosphorus, Total as P	1.00	2.86		3.82	mg/L		96	(63%-139%)		09/06/17	08:19
Batch	1698270										
QC1203869021	431850001	DUP									
Nitrogen, Nitrate/Nitrite		0.134		0.134	mg/L	0 ^		(+/-0.050)	AXH3	09/05/17	10:07
QC1203869020	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.05	mg/L		105	(90%-110%)		09/05/17	10:05
QC1203869019	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					09/05/17	10:03
QC1203869024	431850001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.134		1.18	mg/L		105	(90%-110%)		09/05/17	10:08
Solids Analysis											
Batch	1698442										
QC1203869510	431851001	DUP									
Total Dissolved Solids		417		441	mg/L	5.66*		(0%-5%)	KLP1	09/05/17	13:26
QC1203869507	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		09/05/17	13:26
QC1203869506	MB										
Total Dissolved Solids			U	ND	mg/L					09/05/17	13:26

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QC Summary

Workorder: 431853

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1697772										
QC1203867923	431879008	DUP									
Alkalinity, Total as CaCO3		52.3		50.5	mg/L	3.5		(0%-20%)	RXB5	09/02/17	19:02
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203867919	LCS										
Alkalinity, Total as CaCO3	100			109	mg/L		109	(90%-110%)		09/02/17	18:29
QC1203867925	431879008	MS									
Alkalinity, Total as CaCO3	100	52.3		155	mg/L		103	(80%-120%)		09/02/17	19:03
Batch	1697783										
QC1203867946	431879008	DUP									
pH	H	7.34	H	7.36	SU	0.272		(0%-5%)	RXB5	09/02/17	19:01
QC1203867945	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		09/02/17	18:37
Batch	1701648										
QC1203877745	431853001	DUP									
Conductivity		267		268	umhos/cm	0.374		(0%-10%)	VH1	09/20/17	15:07
QC1203877746	432189001	DUP									
Conductivity		199		199	umhos/cm	0		(0%-10%)		09/20/17	15:12
QC1203877744	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		09/20/17	15:05

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

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QC Summary

Workorder: 431853

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

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

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

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

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

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