

The order of this data package is as follows:

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

Comments:

Revised data begins on page 176.

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-134176

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/02/2017	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	0959		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Canon de Valle below MDA P		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time

HH:MM

COLLECTED BY (PRINT): K. Tow & M. Shudo

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>Katrina Tow</i>	Date/Time 06/02/2017 1350	RECEIVED BY (Printed Name) (Signature)	K. Green <i>K. Green</i>	Date/Time 6/2/17 1156
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133352

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/02/2017	OK	FIELD MATRIX:	WS	OK
TIME COLLECTED (HH:MM):	0959		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	Canon de Valle below MDA P		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <input checked="" type="radio"/> NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE	Y	MA
	WSP-All Metals	1 LITER POLY	1	HNO3		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time

0959

HH:MM

COLLECTED BY (PRINT): K. Tow & M. Shudo

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 06/02/2017 1350	RECEIVED BY (Printed Name) (Signature)	K. G. Lee <i>[Signature]</i>	Date/Time 6/2/17 1150
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133309

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/02/2017 06/20/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1227		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	CDV-16-02656		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 06/02/2017 1350	RECEIVED BY (Printed Name) (Signature)	K. Green <i>[Signature]</i>	Date/Time 6/2/17 1:50
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133281

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06/02/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:27		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	PP	
LOCATION ID:	CDV-16-02656		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	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: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time	1227	HH:MM	Dissolved Oxygen	2.60	Flow (in gpm)	0.13
Oxidation-Reduction Potential	107.4		pH	6.53	Specific Conductance	185.8
Temperature	10.9		Turbidity	6.0		

COLLECTED BY (PRINT): K. TOW

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 06/02/2017 1350	RECEIVED BY (Printed Name) (Signature)	K. Brown <i>[Signature]</i>	Date/Time 6/2/17 1:50
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 05/30/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1647

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424735	EPA:120.1	2				
424735	EPA:150.1	2				
424735	EPA:160.1	2				
424735	EPA:170.0	4				
424735	EPA:245.2	4				
424735	EPA:300.0	2				
424735	EPA:310.1	2				
424735	EPA:335.4	2				
424735	EPA:350.1	2				
424735	EPA:351.2	2				
424735	EPA:353.2	2				
424735	EPA:365.4	2				
424735	SM:A2340B	3				
424735	SW-846:6010C	3				
424735	SW-846:6020	3				
424735	SW-846:6850	2				
424735	SW-846:8330B	2				
424735	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
424735	EPA:120.1	1671823	1671823	2										1				2			
424735	EPA:150.1	1671988	1671988	2										1				2			
424735	EPA:160.1	1672860	1672860	2					1					1				1			
424735	EPA:170.0	NA	NA	4																	
424735	EPA:245.2	1673477	1673474	4					1	2				1				2			
424735	EPA:300.0	1671680	1671680	2					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
424735	EPA:310.1	1671987	1671987	2						1				2			1				
424735	EPA:335.4	1671534	1671533	2					1	1				1			1				
424735	EPA:350.1	1671935	1671933	2					1	1				1			1				
424735	EPA:351.2	1671942	1671941	2					1	1				1			1				
424735	EPA:353.2	1671832	1671832	2					1					1			2				
424735	EPA:365.4	1671937	1671936	2					1	1				1			1				
424735	SM:A2340B	1677435	1677435	3																	
424735	SW-846:6010C	1671565	1671563	3					1	1				1			1				
424735	SW-846:6020	1671589	1671587	3					1	1				1			1				
424735	SW-846:6850	1671834	1671833	2					1	1	1			1							
424735	SW-846:8330B	1671746	1671745	2					1	1	1			1							
424735	SW-846:9060	1671529	1671529	2					1					1	1		1				

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133306	1203805835	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133332	1203805836	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203805834	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133306	1203806296	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806297	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203806295	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-134176	1203808588	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203808587	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203808586	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133281	424735003	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133352	424735001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810088	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810090	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810087	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133278	1203810089	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133281	424735003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-133352	424735001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203810086	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203810085	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-134176	1203805355	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203805354	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203805353	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806285	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806287	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203806283	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203808726	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805010	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805012	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133281	424735003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-133352	424735001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203805009	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203805008	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806103	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806104	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203806102	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203806101	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806128	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806129	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133281	424735003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-133352	424735001	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	LCS	1203806127	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203806126	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-134176	1203805866	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203805864	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203805863	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	MSGP-17-132059	1203805867	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133309	424735004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	1203806120	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	1203806121	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	424735002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203806113	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203806112	MB	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133309	424735004	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133352	424735001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAWA-17-134176	424735002	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805073	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805074	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133309	424735004	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-133352	424735001	REG	16	0	0	0
SW-846:6010C	INORGANIC	CAWA-17-134176	424735002	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203805072	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203805071	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805128	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805129	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133309	424735004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-133352	424735001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAWA-17-134176	424735002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203805127	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203805126	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805877	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805878	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133309	424735004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-134176	424735002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203805876	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203805875	MB	1	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133281	424735003	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805559	MS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133288	1203805560	MSD	0	1	20	0

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	CAWA-17-133352	424735001	REG	20	1	0	0
SW-846:8330B	LCMS/MS HIGH	LCS	1203805556	LCS	0	1	20	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	20	1	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17133356	1203805984	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133281	424735003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-133352	424735001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203805982	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	LCSD	1203805983	LCSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203805981	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203805071	METHOD BLANK	SW-846:6010C	W	Zinc	-4.22	J	ug/L	10.0
MB	1203806101	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0385	J	mg/L	0.050
MB	1203806126	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0715	J	mg/L	0.100

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
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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
CAWA-17-134176	1203806101	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0385	mg/L	0.0716		0.050	Y	5	100	Y
CAWA-17-133309	1203806101	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0385	mg/L	0.130		0.050	Y	5	100	Y
CAWA-17-133352	1203806126	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0715	mg/L	0.322		0.100	Y	5	100	Y
CAWA-17-133281	1203806126	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0715	mg/L	0.204		0.100	Y	5	100	Y
CAWA-17-133352	1203805071	METHOD BLANK	SW-846:6010C	Zinc	-4.22	ug/L	10.0	U	10.0	N			
CAWA-17-134176	1203805071	METHOD BLANK	SW-846:6010C	Zinc	-4.22	ug/L	10.0	U	10.0	N			
CAWA-17-133309	1203805071	METHOD BLANK	SW-846:6010C	Zinc	-4.22	ug/L	10.0	U	10.0	N			

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

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

DATA VALIDATION REPORT

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter 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
CDV-16-02656	2017-1647	CAWA-17-133281	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	I4	N	0.204	mg/L	0.204	mg/L			W	06/02/2017		1671942	VAL	Y	
CDV-16-02656	2017-1647	CAWA-17-133309	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	U	I4	N	0.130	mg/L	0.130	mg/L			W	06/02/2017		1671935	VAL	Y	
Canon de Valle below MDA P	2017-1647	CAWA-17-133352	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	U	I4	N	0.322	mg/L	0.322	mg/L			W	06/02/2017		1671942	VAL	Y	
Canon de Valle below MDA P	2017-1647	CAWA-17-134176	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	U	I4	N	0.0716	mg/L	0.0716	mg/L			W	06/02/2017		1671935	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
-----------------	-------------	----------------	-------------------	-----------------------	---------------

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133281	CDV-16-02656	REG	EPA:170.0	0	1
CAWA-17-133281	CDV-16-02656	REG	EPA:245.2	0	1
CAWA-17-133281	CDV-16-02656	REG	EPA:335.4	0	1
CAWA-17-133281	CDV-16-02656	REG	EPA:351.2	0	1
CAWA-17-133281	CDV-16-02656	REG	SW-846:8330B	0	20
CAWA-17-133281	CDV-16-02656	REG	SW-846:9060	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:120.1	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:150.1	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:160.1	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:170.0	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:245.2	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:300.0	0	4
CAWA-17-133309	CDV-16-02656	REG	EPA:310.1	0	2
CAWA-17-133309	CDV-16-02656	REG	EPA:350.1	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:353.2	0	1
CAWA-17-133309	CDV-16-02656	REG	EPA:365.4	0	1
CAWA-17-133309	CDV-16-02656	REG	SM:A2340B	0	1
CAWA-17-133309	CDV-16-02656	REG	SW-846:6010C	0	17
CAWA-17-133309	CDV-16-02656	REG	SW-846:6020	0	11
CAWA-17-133309	CDV-16-02656	REG	SW-846:6850	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	EPA:170.0	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	EPA:245.2	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	EPA:335.4	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	EPA:351.2	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	SM:A2340B	0	1
CAWA-17-133352	Canon de Valle below MDA	REG	SW-846:6010C	0	16
CAWA-17-133352	Canon de Valle below MDA	REG	SW-846:6020	0	11
CAWA-17-133352	Canon de Valle below MDA	REG	SW-846:8330B	0	20
CAWA-17-133352	Canon de Valle below MDA	REG	SW-846:9060	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:120.1	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:150.1	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:160.1	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:170.0	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:245.2	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:300.0	0	4
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:310.1	0	2
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:350.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:353.2	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	EPA:365.4	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	SM:A2340B	0	1
CAWA-17-134176	Canon de Valle below MDA	REG	SW-846:6010C	0	17
CAWA-17-134176	Canon de Valle below MDA	REG	SW-846:6020	0	11
CAWA-17-134176	Canon de Valle below MDA	REG	SW-846:6850	0	1

DATA VALIDATION REPORT

Chain Of Custody No. 2017-1647 - Rev

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424735	SW-846:8330B	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
424735	EPA:245.2	1673477	1673474							1							1				
424735	SW-846:8330B	1671746	1671745	2					1												

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAPA-17133354	1203810088	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-17133354	1203810090	MS	0	0	1	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133281	424735003	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	CAWA-17-133352	424735001	REG	3	0	0	0
SW-846:8330B	LCMS/MS HIGH	MB	1203805555	MB	3	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

DATA VALIDATION REPORT

No.

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

Reason Code

Description

DATA VALIDATION REPORT

Reason Code

Description

J_LAB

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

NQ

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

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133281	CDV-16-02656	REG	SW-846:8330B	0	3
CAWA-17-133352	Canon de Valle below MDA	REG	SW-846:8330B	0	3

June 26, 2017

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

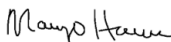
Re: LANL- WQH Water Samples
Work Order: 424735
SDG: 2017-1647

Dear Mr. Greene:

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

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

Sincerely,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-1647
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 424735
SDG: 2017-1647

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 424735
SDG # : 2017-1647**

June 26, 2017

Laboratory Identification:

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

Summary

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

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
424735001	CAWA-17-133352
424735002	CAWA-17-134176
424735003	CAWA-17-133281
424735004	CAWA-17-133309

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, General Chemistry, Metals and Perchlorates by LCMSMS.

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

Margo Herron
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 26 June 2017

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	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424735</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/6/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1782 1683 - 4°C</u> <u>5908 1782 1672 - 4°C</u> <u>5908 1782 1650 - 3°C</u> <u>5908 1782 1694 - 4°C</u> <u>5908 1782 1709 - 5°C</u> <u>5908 1782 1640 - 5°C</u> <u>5908 1782 1661 - 5°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input 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): <u>0</u> 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
1 Shipping containers received intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Chain of custody documents included with shipment?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5 Sample containers intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7 Do any samples require Volatile Analysis?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8 Samples received within holding time?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9 Sample ID's on COC match ID's on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10 Date & time on COC match date & time on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11 Number of containers received match number indicated on COC?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
12 Are sample containers identifiable as GEL provided?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13 COC form is properly signed in relinquished/received sections?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed): <u>* We also rec'd 2 VOA vials for CAWA-17-13394 not indicated on the CoC.</u> <u>* We only rec'd 1 VOA vial for WASTMD-17-136839</u> <u>Both Vials for - 17-13394 and 1 vial for 17-13364 not indicated on CoC</u> <u>We received sample CAWA-17-134191 5/31/17 8:54</u>			

PM (or PMA) review: Initials MCHDate 6/7/17Page 1 of 1

GL-CHL-SR-001 Rev 5

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

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

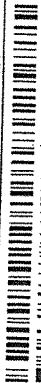
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

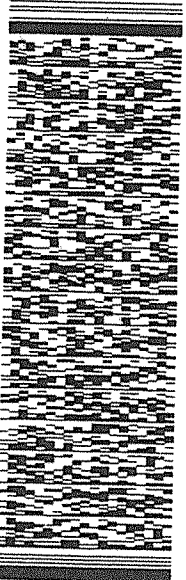
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



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Express



2 of 2

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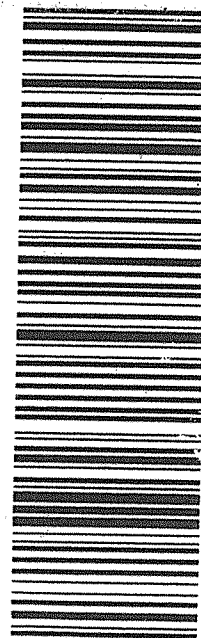
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0201

X7 RBWA

29407
SC-US CHS

TUE - 06 JUN 10:30A
PRIORITY OVERNIGHT



Part # 156148V-434 RT2 06/15 33

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

SHIP DATE: 05JUN17
ACTWGT: 50.0 LB MAN
CAD: 0014176/CAFE2916

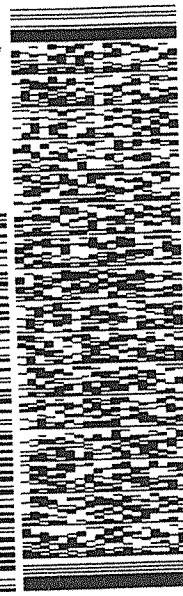
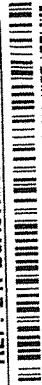
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

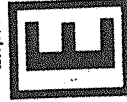
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



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Express



1 of 2

TRK# 5908 1782 1683

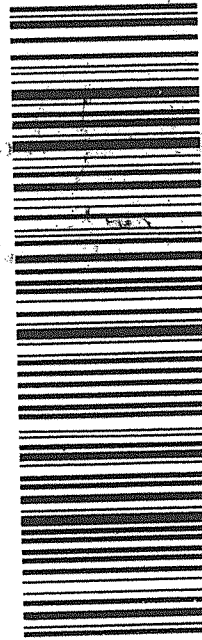
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MASTER

X7 RBWA

29407
SC-US CHS

TUE - 06 JUN 10:30A
PRIORITY OVERNIGHT



Part # 156148V-434 RT2 06/15 33

538C1/A502/329B

151315081201W

4c

3c

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

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

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 05JUN17
ACTWGT: 53.0 LB MAN
CAD: 0014176/CAFE2916

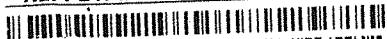
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Expre



1 of 2
TRK# 5908 1782 1640
0201
MASTER

X7 RBWA

2940
SC-US CH

TUE - 06 JUN 10:30
PRIORITY OVERNIGHT



2 of 2
MPS# 5908 1782 1672
0263
Mstr# 5908 1782 1661

X7 RBWA

2940
SC-US CH

TUE - 06 JUN 10:30
PRIORITY OVERNIGHT



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

BILL SENDER

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

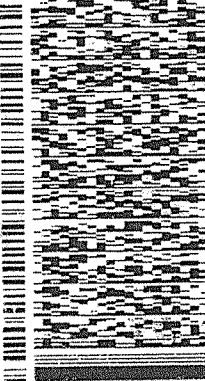
TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



TUE - 06 JUN 10:30
PRIORITY OVERNIGHT

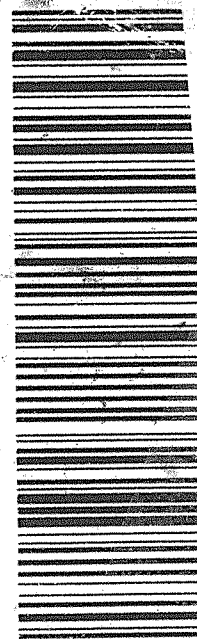
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0263

Mstr# 5908 1782 1683

X7 RBWA

SC-US

29407
CHS



Part # 156148V-434 R1T2 06/15

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

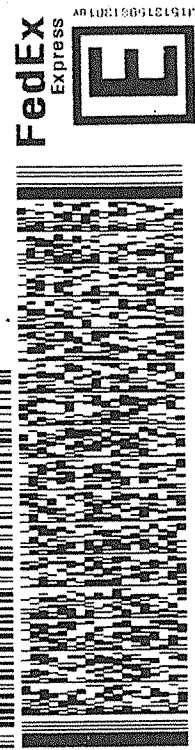
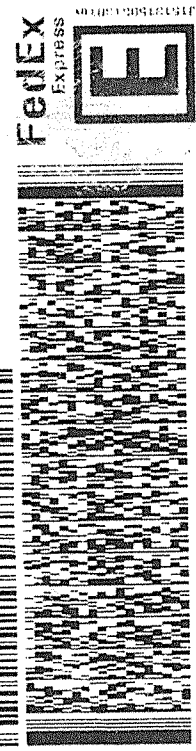
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: 21PD0ASRGW04BAGWE0

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

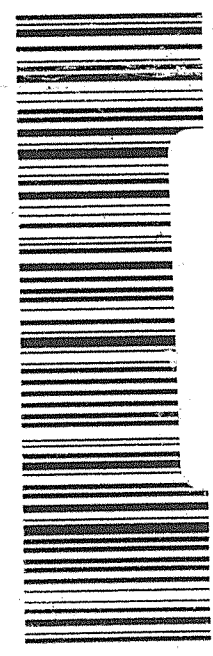
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
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(843) 556-8171
REF: 21PD0ASRGW04BAGWE0



TRK# 5908 1782 1709
0201
TUE - 06 JUN 10:30A
PRIORITY OVERNIGHT

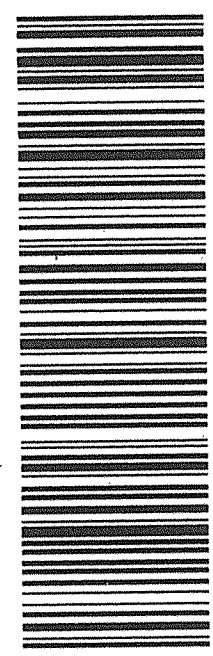
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PRIORITY OVERNIGHT

X7 RBWA
29407
SC-US CHS



SHIP DATE: 05JUN17
ACTWGT: 56.0 LB MAN
CAD: 0014176/CAFE2916

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

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

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Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
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*	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.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1671834

Prep Batch Number: 1671833

Sample Analysis

Sample ID	Client ID
424735002	424735002 (CAWA-17-134176)
424735004	424735004 (CAWA-17-133309)
1203805879	Interference Check Sample (ICS)
1203805875	Method Blank (MB)
1203805876	Laboratory Control Sample (LCS)
1203805877	424741001(CAPA-17-133353) Matrix Spike (MS)
1203805878	424741001(CAPA-17-133353) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

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

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 424741001 (CAPA-17-133353) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 14 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-134176Date Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 424735002Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.113	ug/L	J	1	07-JUN-17 18:23	per0607016a
	Perchlorate Isotope Ratio			2.91			1	07-JUN-17 18:23	per0607016a
14797-73-0	Perchlorate-101	.05	.2	0.110	ug/L	J	1	07-JUN-17 18:23	per0607016a
	Perchlorate-O(18)			0.460	ug/L		1	07-JUN-17 18:23	per0607016a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133309Date Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 424735004Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.165	ug/L	J	1	07-JUN-17 18:32	per0607017a
	Perchlorate Isotope Ratio			2.78			1	07-JUN-17 18:32	per0607017a
14797-73-0	Perchlorate-101	.05	.2	0.168	ug/L	J	1	07-JUN-17 18:32	per0607017a
	Perchlorate-O(18)			0.439	ug/L		1	07-JUN-17 18:32	per0607017a

^ 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): 2017-1647

Extract Batch Code: 1671833

Date Filtered: 07-JUN-17

Matrix: WATER

Sample ID: 1203805876

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

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-1647

Extract Batch Code: 1671833

Date Extracted: 07-JUN-17

GEL MS/PS ID: 1203805877

Client ID: CAPA-17-133353

GEL MSD/PSD ID: 1203805878

QC Type: MS

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

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805875Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate Isotope Ratio						1	07-JUN-17 17:56	per0607013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate-O(18)			0.465	ug/L		1	07-JUN-17 17:56	per0607013a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805876Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.209	ug/L		1	07-JUN-17 18:05	per0607014a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 18:05	per0607014a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	07-JUN-17 18:05	per0607014a
	Perchlorate-O(18)			0.470	ug/L		1	07-JUN-17 18:05	per0607014a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805879Date Filtered: 07-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.199	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate Isotope Ratio			2.89			1	07-JUN-17 18:14	per0607015a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate-O(18)			0.504	ug/L		1	07-JUN-17 18:14	per0607015a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDate Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805877Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.874	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate Isotope Ratio			3.08			1	07-JUN-17 18:59	per0607020a
14797-73-0	Perchlorate-101	.05	.2	0.801	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate-O(18)			0.435	ug/L		1	07-JUN-17 18:59	per0607020a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDDate Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805878Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.806	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate Isotope Ratio			2.97			1	07-JUN-17 19:08	per0607021a
14797-73-0	Perchlorate-101	.05	.2	0.766	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate-O(18)			0.446	ug/L		1	07-JUN-17 19:08	per0607021a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1671746

Prep Batch Number: 1671745

Sample Analysis

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

Sample ID	Client ID
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

All calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB), 424735001 (CAWA-17-133352) and 424735003 (CAWA-17-133281) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

Calibration Blank Requirements

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

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

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

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

QC Sample Designation

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

Matrix Spike (MS) Recovery Statement

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

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

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

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

Manual Integrations

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUN 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133352

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735001

Sample Amount 890 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608041.wiff

Date Analyzed: 09-JUN-17 16:36

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	.159	J	0.0899	0.281
35572-78-2	2-Amino-4,6-dinitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	.263	J	0.0899	0.281
19406-51-0	4-Amino-2,6-dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	.281	U	0.0899	0.281
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.281	U	0.0899	0.281
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.281	U	0.0899	0.281
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.281	U	0.0921	0.281
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.281	U	0.0899	0.281
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.281	U	0.0899	0.281
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.281	U	0.0899	0.281
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.281	U	0.0899	0.281
99-65-0	m-Dinitrobenzene				
479-45-8	Tetryl	.562	U	0.0899	0.562
479-45-8	Tetryl				
78-11-5	PETN	.562	U	0.112	0.562
78-11-5	PETN				
99-99-0	p-Nitrotoluene	.562	U	0.169	0.562
99-99-0	p-Nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133352

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735001

Sample Amount 890 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.12	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.12	QU	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.12	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.81	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	2.81	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	6.89		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				
2691-41-0	HMX	8.6		0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133281

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735003

Sample Amount 860 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608042.wiff

Date Analyzed: 09-JUN-17 17:11

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	.162	J	0.093	0.291
<i>2691-41-0</i>	<i>HMX</i>				
118-96-7	2,4,6-Trinitrotoluene	.291	U	0.093	0.291
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.291	U	0.093	0.291
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.291	U	0.093	0.291
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.291	U	0.093	0.291
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	.291	U	0.093	0.291
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	.291	U	0.0953	0.291
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.291	U	0.093	0.291
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.291	U	0.093	0.291
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	.291	U	0.093	0.291
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	.291	U	0.093	0.291
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.581	U	0.093	0.581
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.581	U	0.116	0.581
<i>78-11-5</i>	<i>PETN</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133281

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735003

Sample Amount 860 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-99-0	p-Nitrotoluene	.581	U	0.174	0.581
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
121-82-4	RDX	.692		0.093	0.291
<i>121-82-4</i>	<i>RDX</i>				
3058-38-6	TATB	1.16	U	0.349	1.16
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.16	QU	0.349	1.16
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.16	U	0.349	1.16
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.91	U	0.581	2.91
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.91	U	0.581	2.91
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1647**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424735001	CAWA-17-133352	97	55 - 115	
424735003	CAWA-17-133281	74	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL LCS ID: 1203805556

GEL LCSDUP ID: .

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

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

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

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL Spike ID: 1203805559

GEL SpikeDup ID: 1203805560

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

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

Reporting Units: ug/L

QC Type: MS/MSD

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

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1647Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1647Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 08-JUN-17 22:28

GEL Data File: EXP0608010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 09-JUN-17 00:49

GEL Data File: EXP0608014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 09-JUN-17 04:54

GEL Data File: EXP0608021.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 09-JUN-17 07:15

GEL Data File: EXP0608025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 09-JUN-17 08:25

GEL Data File: EXP0608027.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 09-JUN-17 14:51

GEL Data File: EXP0608038.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 09-JUN-17 16:01

GEL Data File: EXP0608040.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 09-JUN-17 22:27

GEL Data File: EXP0608051.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 10-JUN-17 03:42

GEL Data File: EXP0608060.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Miscellaneous

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

Originator's Name:

Charles Wilson 14-JUN-17

Data Validator/Group Leader:

Michael Penny 14-JUN-17

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735

Sample ID	Client ID
424735001	CAWA-17-133352
424735002	CAWA-17-134176
424735003	CAWA-17-133281
424735004	CAWA-17-133309
1203805071	Method Blank (MB) ICP
1203805072	Laboratory Control Sample (LCS)
1203805075	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805073	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805074	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805126	Method Blank (MB) ICP-MS
1203805127	Laboratory Control Sample (LCS)
1203805130	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805128	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805129	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203810085	Method Blank (MB) CVAA
1203810086	Laboratory Control Sample (LCS)
1203810091	424596001(CAWA-17-133278L) Serial Dilution (SD)
1203810087	424596001(CAWA-17-133278D) Sample Duplicate (DUP)
1203810089	424596001(CAWA-17-133278S) Matrix Spike (MS)

Sample Analysis

Samples 424735001,002,003 and 004 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

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

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium, sodium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 424735001 (CAWA-17-133352), 424735002 (CAWA-17-134176) and 424735004 (CAWA-17-133309)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 424741001 (CAPA-17-133353)-ICP and ICP-MS and 424596001 (CAWA-17-133278)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration

is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 26 JUN 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133352**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:30	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735001

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-133352

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	164	ug/L	J	68	200	200	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-39-3	Barium	2570	ug/L		1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-42-8	Boron	22.6	ug/L	J	15	50	50	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-70-2	Calcium	19600	ug/L		50	200	200	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-89-6	Iron	106	ug/L		30	100	100	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7439-95-4	Magnesium	4710	ug/L		110	300	300	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-96-5	Manganese	7.92	ug/L	J	2	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-98-7	Molybdenum	0.812	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-09-7	Potassium	3210	ug/L		50	150	150	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-23-5	Sodium	18200	ug/L		100	300	300	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-24-6	Strontium	143	ug/L		1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7440-31-5	Tin	2.64	ug/L	J	2.5	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7440-62-2	Vanadium	1.42	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133352**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	68.3	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735002**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-134176**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:32	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735002

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-134176

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-39-3	Barium	2500	ug/L		1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-42-8	Boron	21.3	ug/L	J	15	50	50	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-70-2	Calcium	19100	ug/L		50	200	200	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-89-6	Iron	41.8	ug/L	J	30	100	100	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7439-95-4	Magnesium	4580	ug/L		110	300	300	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-96-5	Manganese	5.48	ug/L	J	2	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-98-7	Molybdenum	0.850	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-02-0	Nickel	0.863	ug/L	J	0.6	2	2	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-09-7	Potassium	3140	ug/L		50	150	150	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7631-86-9	Silica	35600	ug/L		53	213	213	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-23-5	Sodium	17400	ug/L		100	300	300	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-24-6	Strontium	138	ug/L		1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7440-62-2	Vanadium	1.64	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735002**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-134176**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	66.5	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735003**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133281**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:34	061417W1-7	1673477

Prep Information:

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

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735004**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133309**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:35	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735004

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-133309

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	400	ug/L		68	200	200	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-39-3	Barium	1840	ug/L		1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-70-2	Calcium	15900	ug/L		50	200	200	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-89-6	Iron	207	ug/L		30	100	100	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7439-95-4	Magnesium	4300	ug/L		110	300	300	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-96-5	Manganese	10.9	ug/L		2	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-98-7	Molybdenum	0.769	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-02-0	Nickel	0.672	ug/L	J	0.6	2	2	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-09-7	Potassium	2930	ug/L		50	150	150	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7631-86-9	Silica	37700	ug/L		53	213	213	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-23-5	Sodium	15000	ug/L		100	300	300	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-24-6	Strontium	111	ug/L		1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7440-62-2	Vanadium	1.05	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735004**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133309**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	57.5	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1647

Contract: ESHL00114

Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1203805071	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	-4.22	ug/L	+/-10	J	P	3.3	10
1203805126	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 424741001

Spike ID: 1203805074

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

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647 Client ID: CAPA-17-133353S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424741001 Spike ID: 1203805129

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.1		1	U	50	99.8		MS
Arsenic	ug/L	75-125	52		2	U	50	100		MS
Cadmium	ug/L	75-125	49.9		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	49.6		3	U	50	97.4		MS
Lead	ug/L	75-125	47.4		0.5	U	50	94.5		MS
Molybdenum	ug/L	75-125	51.9		0.948		50	102		MS
Nickel	ug/L	75-125	49.1		0.812	J	50	96.5		MS
Selenium	ug/L	75-125	47		2	U	50	92		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	43.9		0.6	U	50	87.8		MS
Uranium	ug/L	75-125	46.6		0.184	J	50	92.8		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647 **Client ID:** CAWA-17-133278S**Contract:** ESHL00114 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 424596001 **Spike ID:** 1203810089

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.05		0.067	U	2	103		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 2017–1647

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–17–133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805073

Percent Solids for Dup: N/A

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

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1647

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805128

Percent Solids for Dup: N/A

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

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1647**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-17-133278D**Matrix:** WATER**Level:** Low**Sample ID:** 424596001**Duplicate ID:** 1203810087**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. 2017-1647

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203805072								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5070		101	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	520		104	80-120	P
	Iron	ug/L	5000	5120		102	80-120	P
	Magnesium	ug/L	5000	5170		103	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5150		103	80-120	P
	Silica	ug/L	10700	10600		99.1	80-120	P
	Sodium	ug/L	5000	5490		110	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	499		99.9	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	479		95.8	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1647

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203805127								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	53.3		107	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	51.8		104	80-120	MS
	Lead	ug/L	50	49.5		99	80-120	MS
	Molybdenum	ug/L	50	49.8		99.6	80-120	MS
	Nickel	ug/L	50	51.9		104	80-120	MS
	Selenium	ug/L	50	51.2		102	80-120	MS
	Silver	ug/L	50	50.7		101	80-120	MS
	Thallium	ug/L	50	45.1		90.3	80-120	MS
	Uranium	ug/L	50	47.2		94.5	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2017-1647

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805075

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	664		679	J	2.358			P
Barium	56.6		57.7		1.911		10	P
Beryllium	1	U	5	U				P
Boron	17.3	J	75	U	52.718			P
Calcium	15700		16100		2.573		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	325		339	J	4.313			P
Magnesium	4110		4070		1.058			P
Manganese	2	U	10	U				P
Potassium	2930		3030		3.494		10	P
Silica	40500		40100		.913		10	P
Sodium	19600		20700		5.351		10	P
Strontium	95.7		98.4		2.825		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.28	J	5	U	135.167			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805130

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

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1647 **Client ID:** CAWA-17-133278L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424596001 **Serial Dilution ID:** 1203810091

<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 #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1671529

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805981	Method Blank (MB)
1203805982	Laboratory Control Sample (LCS)
1203805984	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805986	424739002(CAPA-17133356) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1671534	Method:	WSP-CN(T)
Prep Batch :	1671533	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
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805008	Method Blank (MB)
1203805009	Laboratory Control Sample (LCS)
1203805010	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805012	424739002(CAPA-17133356) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1671680

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805353	Method Blank (MB)
1203805354	Laboratory Control Sample (LCS)
1203805355	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805356	424735002(CAWA-17-134176) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS), 424735002 (CAWA-17-134176) and 424735004 (CAWA-17-133309) 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	424735	
	002	004
Chloride	2X	2X

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

Samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS), 424735002

(CAWA-17-134176) and 424735004 (CAWA-17-133309) 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: 1671935 **Method:** NH3
Prep Batch : 1671933 **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
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806101	Method Blank (MB)
1203806102	Laboratory Control Sample (LCS)
1203806103	424741001(CAPA-17-133353) Sample Duplicate (DUP)
1203806104	424741001(CAPA-17-133353) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1671942	Method:	TKN
Prep Batch :	1671941	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
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203806126	Method Blank (MB)
1203806127	Laboratory Control Sample (LCS)
1203806128	424741002(CAPA-17-133355) Sample Duplicate (DUP)
1203806129	424741002(CAPA-17-133355) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424741002 (CAPA-17-133355) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203806126 (MB) and 1203806127 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1671832

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805863	Method Blank (MB)
1203805864	Laboratory Control Sample (LCS)
1203805866	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805867	424853003(NonSDG) Sample Duplicate (DUP)
1203805871	424735002(CAWA-17-134176) Post Spike (PS)
1203805872	424853003(NonSDG) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1671937	Method:	PO4
Prep Batch :	1671936	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
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806112	Method Blank (MB)
1203806113	Laboratory Control Sample (LCS)
1203806120	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203806121	424735002(CAWA-17-134176) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1672860

Method: TDS

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203808586	Method Blank (MB)
1203808587	Laboratory Control Sample (LCS)
1203808588	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1671823

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Calibration Verification Information

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

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1671988 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424735002 (CAWA-17-134176)	pH	Received 06-JUN-17, out of holding 02-JUN-17
424735004 (CAWA-17-133309)	pH	Received 06-JUN-17, out of holding 02-JUN-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1640886 was generated for samples 424735002 (CAWA-17-134176), 424735004 (CAWA-17-133309) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

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

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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.

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Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Kristen Mizzell

Date: 22 JUN 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133352
Sample ID: 424735001
Matrix: W
Collect Date: 02-JUN-17 09:59
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		3.68	0.330	1.00	mg/L		1	TSM	06/09/17	0136	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0958	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.322	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1502	1671942	3

The following Prep Methods were performed:

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

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-134176
Sample ID: 424735002
Matrix: W
Collect Date: 02-JUN-17 09:59
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/06/17	2014	1671680	1
Fluoride		0.161	0.033	0.100	mg/L		1					
Sulfate		7.13	0.133	0.400	mg/L		1					
Chloride		15.2	0.134	0.400	mg/L		2	MXL2	06/08/17	0354	1671680	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0716	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1005	1671935	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	J	0.0222	0.017	0.050	mg/L		1	AXH3	06/09/17	0958	1671832	4
PO4 "As Received"												
Phosphorus, Total as P		0.0744	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1319	1671937	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		141	3.40	14.3	mg/L			KLP1	06/09/17	1546	1672860	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		79.0	1.45	4.00	mg/L			RXB5	06/09/17	1336	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		261	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 10.2C	H	7.95	0.010	0.100	SU		1	RXB5	06/09/17	1334	1671988	9

The following Prep Methods were performed:

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

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Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-134176
Sample ID: 424735002

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Client SDG: 2017-1647

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-133281

Project: ESHL00114

Sample ID: 424735003

Client ID: ARSL004

Matrix: W

Collect Date: 02-JUN-17 12:27

Receive Date: 06-JUN-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.98	0.330	1.00	mg/L		1	TSM	06/09/17	0223	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0959	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.204	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1503	1671942	3

The following Prep Methods were performed:

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

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

Lc/LC: Critical Level

DL: Detection Limit

PF: Prep Factor

MDA: Minimum Detectable Activity

RL: Reporting Limit

MDC: Minimum Detectable Concentration

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133309
Sample ID: 424735004
Matrix: W
Collect Date: 02-JUN-17 12:27
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/06/17	2141	1671680	1
Fluoride		0.161	0.033	0.100	mg/L		1					
Sulfate		8.54	0.133	0.400	mg/L		1					
Chloride		9.44	0.134	0.400	mg/L		2	MXL2	06/08/17	0521	1671680	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.130	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1006	1671935	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.0966	0.017	0.050	mg/L		1	AXH3	06/09/17	1002	1671832	4
PO4 "As Received"												
Phosphorus, Total as P		0.0547	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1321	1671937	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		139	3.40	14.3	mg/L			KLP1	06/09/17	1546	1672860	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		69.8	1.45	4.00	mg/L			RXB5	06/09/17	1339	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		184	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 10.1C	H	7.14	0.010	0.100	SU		1	RXB5	06/09/17	1337	1671988	9

The following Prep Methods were performed:

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

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Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133309
Sample ID: 424735004

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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: June 22, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 424735

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

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QC Summary

Workorder: 424735

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

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QC Summary

Workorder: 424735

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

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QC Summary

Workorder: 424735

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1671937										
QC1203806113	LCS										
Phosphorus, Total as P	1.00			0.848	mg/L		84.8	(80%-124%)	KLP1	06/09/17	13:07
QC1203806112	MB										
Phosphorus, Total as P			U	ND	mg/L					06/09/17	13:06
QC1203806121	424735002	MS									
Phosphorus, Total as P	1.00	0.0744		1.03	mg/L		95.6	(63%-139%)		06/09/17	13:21
Batch	1671942										
QC1203806128	424741002	DUP									
Nitrogen, Total Kjeldahl		0.336		0.308	mg/L	8.7	^	(+/-0.100)	KLP1	06/09/17	15:06
QC1203806127	LCS										
Nitrogen, Total Kjeldahl	1.00			0.953	mg/L		95.3	(90%-110%)		06/09/17	15:14
QC1203806126	MB										
Nitrogen, Total Kjeldahl			J	0.0715	mg/L					06/09/17	15:13
QC1203806129	424741002	MS									
Nitrogen, Total Kjeldahl	1.00	0.336		1.35	mg/L		101	(90%-110%)		06/09/17	15:07
Solids Analysis											
Batch	1672860										
QC1203808588	424735002	DUP									
Total Dissolved Solids		141		139	mg/L	2.04		(0%-5%)	KLP1	06/09/17	15:46
QC1203808587	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		06/09/17	15:46
QC1203808586	MB										
Total Dissolved Solids			U	ND	mg/L					06/09/17	15:46

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QC Summary

Workorder: 424735

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

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

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QC Summary

Workorder: 424735

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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.

Miscellaneous

DATA EXCEPTION REPORT

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

Originator's Name:

Rachael Bell 10-JUN-17

Data Validator/Group Leader:

Elzbieta Szulc 12-JUN-17

Originator's Name:

Rachael Bell 10-JUN-17

Data Validator/Group Leader:

Elzbieta Szulc 12-JUN-17

July 19, 2017

gel.com

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

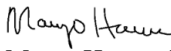
Re: LANL- WQH Water Samples
Work Order: 424735
SDG: 2017-1647

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 06, 2017, and analyzed for Explosives by LCMSMS, General Chemistry, Metals and Perchlorates by LCMSMS. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This package has been revised to include the results for HMX, DNX, and TNX on the HE Form 1s.

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

Sincerely,


Margo Herron for
Valerie Davis
Project Manager

Chain of Custody: 2017-1647
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 424735
SDG: 2017-1647

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 424735
SDG # : 2017-1647**

June 26, 2017

Laboratory Identification:

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

Summary

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

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
424735001	CAWA-17-133352
424735002	CAWA-17-134176
424735003	CAWA-17-133281
424735004	CAWA-17-133309

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, General Chemistry, Metals and Perchlorates by LCMSMS.

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

Margo Herron
Margo Herron for
Valerie Davis
Project Manager

List of current GEL Certifications as of 26 June 2017

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	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424735</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/6/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1782 1683 - 4°C</u> <u>5908 1782 1672 - 4°C</u> <u>5908 1782 1650 - 3°C</u> <u>5908 1782 1694 - 4°C</u> <u>5908 1782 1709 - 5°C</u> <u>5908 1782 1640 - 5°C</u> <u>5908 1782 1661 - 5°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input 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): <u>0</u> 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
1 Shipping containers received intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Chain of custody documents included with shipment?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Daily check performed and passed on IR temperature gun?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5 Sample containers intact and sealed?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
6 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
7 Do any samples require Volatile Analysis?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8 Samples received within holding time?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
9 Sample ID's on COC match ID's on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
10 Date & time on COC match date & time on bottles?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11 Number of containers received match number indicated on COC?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
12 Are sample containers identifiable as GEL provided?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
13 COC form is properly signed in relinquished/received sections?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Comments (Use Continuation Form if needed): <u>* We also rec'd 2 VOA vials for CAWA-17-13394 not indicated on the CoC.</u> <u>* We only rec'd 1 VOA vial for WASTMD-17-136839</u> <u>Both Vials for - 17-13394 and 1 vial for 17-13364 not indicated on CoC</u>			

PM (or PMA) review: Initials

MCH

Date

6/7/17

Page

1

of

1

GL-CHL-SR-001 Rev 5

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

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

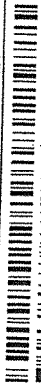
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

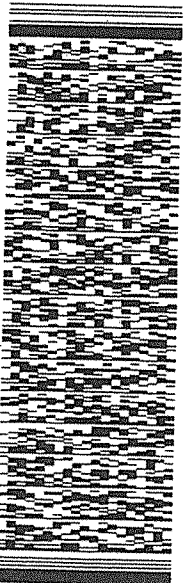
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



FedEx
Express



2 of 2

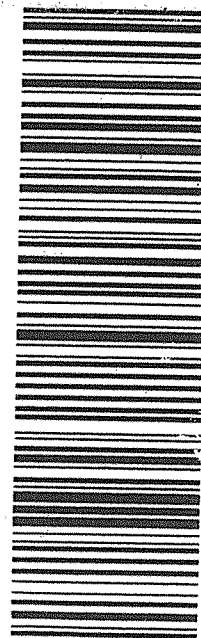
MPS# 5908 1782 1650

Mstr# 5908 1782 1640

X7 RBWA

TUE - 06 JUN 10:30A
PRIORITY OVERNIGHT

29407
SC-US CHS



Part # 156148V-434 RT2 06/15 33

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

SHIP DATE: 05JUN17
ACTWGT: 50.0 LB M/N
CAD: 0014176/CAFE2916

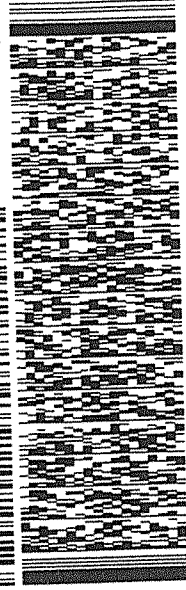
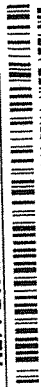
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TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWE0



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1 of 2

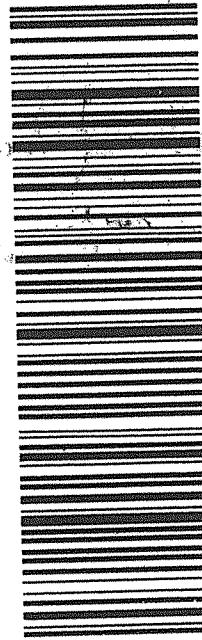
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MASTER

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PRIORITY OVERNIGHT

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SC-US CHS



Part # 156148V-434 RT2 06/15 33

538C1/A502/329B

4c

538C1/A502/329B

3c

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

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

BILL SENDER

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 05JUN17
ACTWGT: 53.0 LB MAN
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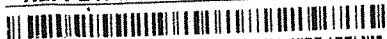
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GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

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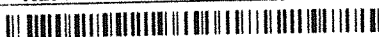


TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



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1 of 2
TRK# 5908 1782 1640
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PRIORITY OVERNIGHT



2 of 2
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0263
Mstr# 5908 1782 1661

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2940
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TUE - 06 JUN 10:30
PRIORITY OVERNIGHT



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

BILL SENDER

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

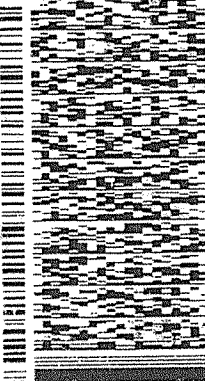
TO VALERIE DAVIS

GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



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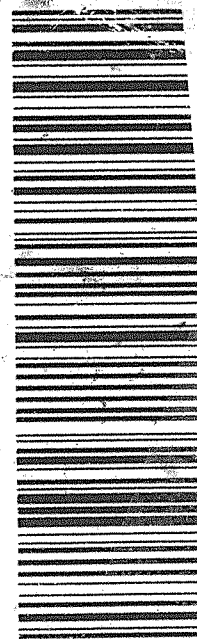
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0263

Mstr# 5908 1782 1683

X7 RBWA

SC-US

29407
CHS



Part # 156148V-434 R1T2 06/15

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

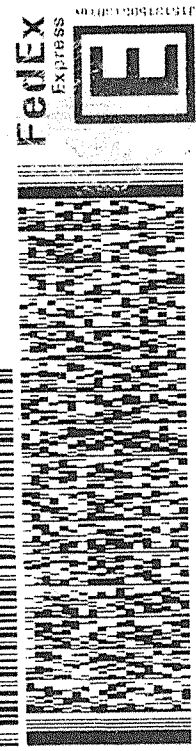
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GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
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LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

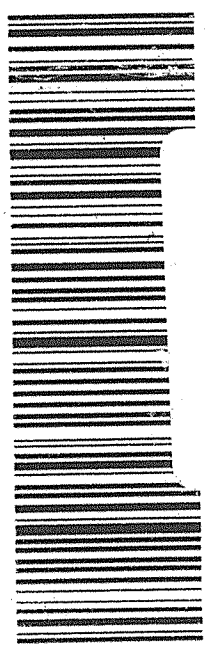
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CHARLESTON SC 29407
(843) 556-8171
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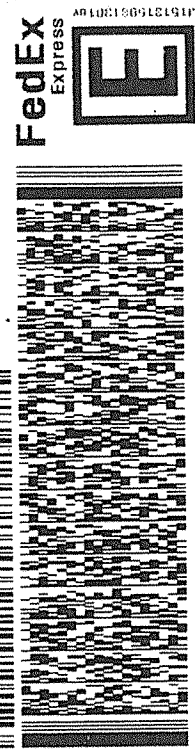
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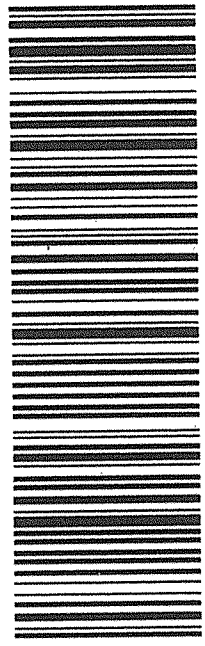
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Part # 156140V-434 RIT2 06/15 39



TUE - 06 JUN 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1782 1661
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29407
SC-US CHS



Part # 156140V-434 RIT2 06/15 39

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier	Explanation
-----------	-------------

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

Procedure: **Definitive Low Level Perchlorate Analysis Utilizing Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS) by EPA Method 6850 Modified (6850M)**

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1671834

Prep Batch Number: 1671833

Sample Analysis

Sample ID	Client ID
424735002	424735002 (CAWA-17-134176)
424735004	424735004 (CAWA-17-133309)
1203805879	Interference Check Sample (ICS)
1203805875	Method Blank (MB)
1203805876	Laboratory Control Sample (LCS)
1203805877	424741001(CAPA-17-133353) Matrix Spike (MS)
1203805878	424741001(CAPA-17-133353) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 14.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

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

CCB Requirements

All continuing calibration blanks (CCB) bracketing the analyses associated with this batch were within acceptance criteria.

CCV Requirements

All continuing calibration checks (CCV) requirements were met by all bracketing CCV standards.

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 424741001 (CAPA-17-133353) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 14 JUN 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-134176Date Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 424735002Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.113	ug/L	J	1	07-JUN-17 18:23	per0607016a
	Perchlorate Isotope Ratio			2.91			1	07-JUN-17 18:23	per0607016a
14797-73-0	Perchlorate-101	.05	.2	0.110	ug/L	J	1	07-JUN-17 18:23	per0607016a
	Perchlorate-O(18)			0.460	ug/L		1	07-JUN-17 18:23	per0607016a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133309Date Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 424735004Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.165	ug/L	J	1	07-JUN-17 18:32	per0607017a
	Perchlorate Isotope Ratio			2.78			1	07-JUN-17 18:32	per0607017a
14797-73-0	Perchlorate-101	.05	.2	0.168	ug/L	J	1	07-JUN-17 18:32	per0607017a
	Perchlorate-O(18)			0.439	ug/L		1	07-JUN-17 18:32	per0607017a

^ 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): 2017-1647

Extract Batch Code: 1671833

Date Filtered: 07-JUN-17

Matrix: WATER

Sample ID: 1203805876

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

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2017-1647

Extract Batch Code: 1671833

Date Extracted: 07-JUN-17

GEL MS/PS ID: 1203805877

Client ID: CAPA-17-133353

GEL MSD/PSD ID: 1203805878

QC Type: MS

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

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805875Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate Isotope Ratio						1	07-JUN-17 17:56	per0607013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate-O(18)			0.465	ug/L		1	07-JUN-17 17:56	per0607013a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805876Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.209	ug/L		1	07-JUN-17 18:05	per0607014a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 18:05	per0607014a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	07-JUN-17 18:05	per0607014a
	Perchlorate-O(18)			0.470	ug/L		1	07-JUN-17 18:05	per0607014a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805879Date Filtered: 07-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.199	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate Isotope Ratio			2.89			1	07-JUN-17 18:14	per0607015a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate-O(18)			0.504	ug/L		1	07-JUN-17 18:14	per0607015a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDate Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805877Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.874	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate Isotope Ratio			3.08			1	07-JUN-17 18:59	per0607020a
14797-73-0	Perchlorate-101	.05	.2	0.801	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate-O(18)			0.435	ug/L		1	07-JUN-17 18:59	per0607020a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDDate Received: 06-JUN-17GEL Job No (SDG): 2017-1647GEL Sample ID: 1203805878Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.806	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate Isotope Ratio			2.97			1	07-JUN-17 19:08	per0607021a
14797-73-0	Perchlorate-101	.05	.2	0.766	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate-O(18)			0.446	ug/L		1	07-JUN-17 19:08	per0607021a

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

*Concentration =

$$\text{Instrument Value} \times \frac{\text{Concentrated Extract Volume}}{\text{Aliquot}} \times \frac{1}{\% \text{Solids}}$$

Explosives by LCMSMS Analysis

Case Narrative

**Explosives by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

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

Analytical Method: SW846 3535A/8330B

Prep Method: SW846 3535A

Analytical Batch Number: 1671746

Prep Batch Number: 1671745

Sample Analysis

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

Sample ID	Client ID
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805555	Method Blank (MB)
1203805556	Laboratory Control Sample (LCS)
1203805559	424596009(CAWA-17-133288) Matrix Spike (MS)
1203805560	424596009(CAWA-17-133288) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

All calibration verification standards (ICV or CCV) have not met requirements of 80-120% for samples 1203805555 (MB), 424735001 (CAWA-17-133352) and 424735003 (CAWA-17-133281) in this SDG. Please refer to Form 7 of the data package for a list of recoveries. The data are Q qualified and reported as stated in the SOP.

Calibration Blank Requirements

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

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

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

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

QC Sample Designation

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

Matrix Spike (MS) Recovery Statement

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

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

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

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

Manual Integrations

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

Additional Comments

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 21 JUN 2017

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133352

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735001

Sample Amount 890 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608041.wiff

Date Analyzed: 09-JUN-17 16:36

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	.159	J	0.0899	0.281
35572-78-2	2-Amino-4,6-dinitrotoluene				
13980-04-6	TNX	.207	J	0.0899	0.281
13980-04-6	TNX				
80251-29-2	DNX	.218	J	0.0899	0.281
80251-29-2	DNX				
19406-51-0	4-Amino-2,6-dinitrotoluene	.263	J	0.0899	0.281
19406-51-0	4-Amino-2,6-dinitrotoluene				
118-96-7	2,4,6-Trinitrotoluene	.281	U	0.0899	0.281
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.281	U	0.0899	0.281
121-14-2	2,4-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene	.281	U	0.0899	0.281
606-20-2	2,6-Dinitrotoluene				
88-72-2	o-Nitrotoluene	.281	U	0.0921	0.281
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.281	U	0.0899	0.281
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.281	U	0.0899	0.281
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.281	U	0.0899	0.281
99-35-4	1,3,5-Trinitrobenzene				
99-65-0	m-Dinitrobenzene	.281	U	0.0899	0.281
99-65-0	m-Dinitrobenzene				
5755-27-1	MNX	.428		0.0899	0.281
5755-27-1	MNX				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133352

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735001

Sample Amount 890 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	.562	U	0.0899	0.562
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	.562	U	0.112	0.562
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.562	U	0.169	0.562
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
3058-38-6	TATB	1.12	U	0.337	1.12
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.12	QU	0.337	1.12
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.12	U	0.337	1.12
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.81	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	2.81	U	0.562	2.81
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
121-82-4	RDX	6.89		0.0899	0.281
<i>121-82-4</i>	<i>RDX</i>				
2691-41-0	HMX	8.6		0.0899	0.281
<i>2691-41-0</i>	<i>HMX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133281

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735003

Sample Amount 860 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608042.wiff

Date Analyzed: 09-JUN-17 17:11

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	.162	J	0.093	0.291
2691-41-0	HMX				
118-96-7	2,4,6-Trinitrotoluene	.291	U	0.093	0.291
118-96-7	2,4,6-Trinitrotoluene				
121-14-2	2,4-Dinitrotoluene	.291	U	0.093	0.291
121-14-2	2,4-Dinitrotoluene				
13980-04-6	TNX	.291	U	0.093	0.291
13980-04-6	TNX				
19406-51-0	4-Amino-2,6-dinitrotoluene	.291	U	0.093	0.291
19406-51-0	4-Amino-2,6-dinitrotoluene				
35572-78-2	2-Amino-4,6-dinitrotoluene	.291	U	0.093	0.291
35572-78-2	2-Amino-4,6-dinitrotoluene				
5755-27-1	MXN	.291	U	0.093	0.291
5755-27-1	MXN				
606-20-2	2,6-Dinitrotoluene	.291	U	0.093	0.291
606-20-2	2,6-Dinitrotoluene				
80251-29-2	DNX	.291	U	0.093	0.291
80251-29-2	DNX				
88-72-2	o-Nitrotoluene	.291	U	0.0953	0.291
88-72-2	o-Nitrotoluene				
98-95-3	Nitrobenzene	.291	U	0.093	0.291
98-95-3	Nitrobenzene				
99-08-1	m-Nitrotoluene	.291	U	0.093	0.291
99-08-1	m-Nitrotoluene				
99-35-4	1,3,5-Trinitrobenzene	.291	U	0.093	0.291
99-35-4	1,3,5-Trinitrobenzene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-17-133281

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 424735003

Sample Amount 860 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	.291	U	0.093	0.291
99-65-0	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	.581	U	0.093	0.581
479-45-8	<i>Tetryl</i>				
78-11-5	PETN	.581	U	0.116	0.581
78-11-5	<i>PETN</i>				
99-99-0	p-Nitrotoluene	.581	U	0.174	0.581
99-99-0	<i>p-Nitrotoluene</i>				
121-82-4	RDX	.692		0.093	0.291
121-82-4	<i>RDX</i>				
3058-38-6	TATB	1.16	U	0.349	1.16
3058-38-6	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.16	QU	0.349	1.16
618-87-1	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.16	U	0.349	1.16
78-30-8	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.91	U	0.581	2.91
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.91	U	0.581	2.91
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary**Lab Name:** GEL Laboratories LLC**GEL Job No (SDG):** 2017-1647**Lab Code:** GEL**HPLC Column:** Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
424735001	CAWA-17-133352	97	55 - 115	
424735003	CAWA-17-133281	74	55 - 115	
1203805555	MB for batch 1671745	102	55 - 115	
1203805556	LCS for batch 1671745	105	55 - 115	
1203805559	CAWA-17-133288MS	81	55 - 115	
1203805560	CAWA-17-133288MSD	93	55 - 115	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL LCS ID: 1203805556

GEL LCSDUP ID: .

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

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
tris(o-cresyl) phosphate	5	3.64	73					43 - 104
1,3,5-Trinitrobenzene	5	4.19	84					70 - 110
2,4,6-Trinitrotoluene	5	4.89	98					69 - 113
2,4-Diamino-6-nitrotoluene	5	3.93	79					50 - 121
2,4-Dinitrotoluene	5	4.41	88					71 - 110
2,6-Diamino-4-nitrotoluene	5	4.21	84					53 - 127
2,6-Dinitrotoluene	5	5.31	106 *					72 - 105
2-Amino-4,6-dinitrotoluene	5	4.52	90					70 - 112
3,5-Dinitroaniline	5	6.02	120					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.76	95					74 - 116
HMX	5	3.92	78					58 - 113
Nitrobenzene	5	4.52	90					64 - 115
PETN	5	4.8	96					57 - 126
RDX	5	4	80					64 - 117
TATB	2.5	3.76	150 *					47 - 135
Tetryl	5	4.01	80					55 - 122
m-Dinitrobenzene	5	4.66	93					74 - 117
m-Nitrotoluene	5	4.63	93					66 - 114
o-Nitrotoluene	5	4.49	90					64 - 115
p-Nitrotoluene	5	4.84	97					66 - 127

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-17-133288

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Extract Batch Code: 1671745

Date Extracted: 07-JUN-17

GEL Spike ID: 1203805559

GEL SpikeDup ID: 1203805560

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

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

Reporting Units: ug/L

QC Type: MS/MSD

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

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608029.wiff

Date Analyzed: 09-JUN-17 09:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	.25	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	.25	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	.25	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	.25	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	.25	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	.25	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	.25	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	.25	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	.25	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	.25	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	.25	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	.25	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	.25	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805555

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608053.wiff

Date Analyzed: 09-JUN-17 23:37

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6 <i>13980-04-6</i>	TNX <i>TNX</i>	.25	U	0.080	0.250
5755-27-1 <i>5755-27-1</i>	MNX <i>MNX</i>	.25	U	0.080	0.250
80251-29-2 <i>80251-29-2</i>	DNX <i>DNX</i>	.25	U	0.080	0.250
78-30-8 <i>78-30-8</i>	tris(o-cresyl) phosphate <i>tris(o-cresyl) phosphate</i>	3.64		0.300	1.00
3058-38-6 <i>3058-38-6</i>	TATB <i>TATB</i>	3.76		0.300	1.00
2691-41-0 <i>2691-41-0</i>	HMX <i>HMX</i>	3.92		0.080	0.250
6629-29-4 <i>6629-29-4</i>	2,4-Diamino-6-nitrotoluene <i>2,4-Diamino-6-nitrotoluene</i>	3.93		0.500	2.50
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	4		0.080	0.250
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	4.01		0.080	0.500
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	4.19		0.080	0.250
59229-75-3 <i>59229-75-3</i>	2,6-Diamino-4-nitrotoluene <i>2,6-Diamino-4-nitrotoluene</i>	4.21		0.500	2.50
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	4.41		0.080	0.250
88-72-2 <i>88-72-2</i>	o-Nitrotoluene <i>o-Nitrotoluene</i>	4.49		0.082	0.250

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1671745

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805556

Sample Amount 1000 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
35572-78-2	2-Amino-4,6-dinitrotoluene	4.52		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
98-95-3	Nitrobenzene	4.52		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.63		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.66		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
78-11-5	PETN	4.8		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.84		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.89		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	5.31		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	6.02		0.300	1.00
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608058.wiff

Date Analyzed: 10-JUN-17 02:32

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
13980-04-6	TNX	.0885	J	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	.175	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.68		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.82		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
3058-38-6	TATB	3.88		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
99-08-1	m-Nitrotoluene	4.09		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.27		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.34		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.46		0.0833	0.260
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.49		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
78-11-5	PETN	4.52		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
118-96-7	2,4,6-Trinitrotoluene	4.56		0.0833	0.260
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805559

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.61		0.0833	0.260
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.64		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.76		0.0833	0.260
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.8		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.93		0.0833	0.260
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.42		0.521	2.60
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	5.74		0.521	2.60
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.81		0.313	1.04
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
2691-41-0	HMX	6.44		0.0833	0.260
<i>2691-41-0</i>	<i>HMX</i>				
121-82-4	RDX	26.4		0.0833	0.260
<i>121-82-4</i>	<i>RDX</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0608059.wiff

Date Analyzed: 10-JUN-17 03:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
5755-27-1	MNX	.164	J	0.0833	0.260
<i>5755-27-1</i>	<i>MNX</i>				
13980-04-6	TNX	.26	U	0.0833	0.260
<i>13980-04-6</i>	<i>TNX</i>				
80251-29-2	DNX	.26	U	0.0833	0.260
<i>80251-29-2</i>	<i>DNX</i>				
78-30-8	tris(o-cresyl) phosphate	3.71		0.313	1.04
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
479-45-8	Tetryl	3.79		0.0833	0.521
<i>479-45-8</i>	<i>Tetryl</i>				
99-08-1	m-Nitrotoluene	3.95		0.0833	0.260
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
3058-38-6	TATB	3.97		0.313	1.04
<i>3058-38-6</i>	<i>TATB</i>				
98-95-3	Nitrobenzene	4		0.0833	0.260
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.01		0.0854	0.260
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.11		0.0833	0.260
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
78-11-5	PETN	4.21		0.104	0.521
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	4.24		0.156	0.521
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.26		0.0833	0.260
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

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

Lab Code: GEL

GEL Job No (SDG) 2017-1647

Matrix: WATER

GEL Sample ID: 1203805560

Sample Amount 960 mL

Date Received: 06-JUN-17

Moisture: .

Extraction Batch ID: 1671745

Extraction Type Sol Exchange

Date Extracted: 07-JUN-17

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.53		0.0833	0.260
99-65-0	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.59		0.0833	0.260
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.7		0.0833	0.260
35572-78-2	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.19		0.0833	0.260
121-14-2	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.32		0.0833	0.260
19406-51-0	<i>4-Amino-2,6-dinitrotoluene</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.58		0.521	2.60
59229-75-3	<i>2,6-Diamino-4-nitrotoluene</i>				
618-87-1	3,5-Dinitroaniline	5.72		0.313	1.04
618-87-1	<i>3,5-Dinitroaniline</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	6.16		0.521	2.60
6629-29-4	<i>2,4-Diamino-6-nitrotoluene</i>				
2691-41-0	HMX	6.47		0.0833	0.260
2691-41-0	<i>HMX</i>				
121-82-4	RDX	22.2		0.0833	0.260
121-82-4	<i>RDX</i>				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1647Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:13GEL Data File: EXP0608001.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2017-1647Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 08-JUN-17 17:48GEL Data File: EXP0608002.wiffInstrument ID: LCMSMS5Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 08-JUN-17 22:28

GEL Data File: EXP0608010.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 09-JUN-17 00:49

GEL Data File: EXP0608014.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 09-JUN-17 04:54

GEL Data File: EXP0608021.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 09-JUN-17 07:15

GEL Data File: EXP0608025.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 09-JUN-17 08:25

GEL Data File: EXP0608027.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 09-JUN-17 14:51

GEL Data File: EXP0608038.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK08

Analysis Date: 09-JUN-17 16:01

GEL Data File: EXP0608040.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK09

Analysis Date: 09-JUN-17 21:16

GEL Data File: EXP0608049.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK10

Analysis Date: 09-JUN-17 22:27

GEL Data File: EXP0608051.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK11

Analysis Date: 10-JUN-17 03:42

GEL Data File: EXP0608060.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
Nitroglycerin	0	0
PETN	0	0
RDX	0	2.54
Tetryl	0	0
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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2017-1647

Lab Code: GEL

Lab Sample ID: XIBLK12

Analysis Date: 10-JUN-17 05:28

GEL Data File: EXP0608063.wiff

Instrument ID: LCMSMS5

Column: Ultracarb Phenomenex 5u ODS (20)

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

Miscellaneous

DATA EXCEPTION REPORT

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

Originator's Name:

Charles Wilson 14-JUN-17

Data Validator/Group Leader:

Michael Penny 14-JUN-17

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2017-1647
Work Order #: 424735

Sample ID	Client ID
424735001	CAWA-17-133352
424735002	CAWA-17-134176
424735003	CAWA-17-133281
424735004	CAWA-17-133309
1203805071	Method Blank (MB) ICP
1203805072	Laboratory Control Sample (LCS)
1203805075	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805073	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805074	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805126	Method Blank (MB) ICP-MS
1203805127	Laboratory Control Sample (LCS)
1203805130	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805128	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805129	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203810085	Method Blank (MB) CVAA
1203810086	Laboratory Control Sample (LCS)
1203810091	424596001(CAWA-17-133278L) Serial Dilution (SD)
1203810087	424596001(CAWA-17-133278D) Sample Duplicate (DUP)
1203810089	424596001(CAWA-17-133278S) Matrix Spike (MS)

Sample Analysis

Samples 424735001,002,003 and 004 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

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

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium, sodium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 424735001 (CAWA-17-133352), 424735002 (CAWA-17-134176) and 424735004 (CAWA-17-133309)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 424741001 (CAPA-17-133353)-ICP and ICP-MS and 424596001 (CAWA-17-133278)-CVAA.

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration

is less than four times (4X) the spike concentration added. The matrix spike met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes.

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

A data exception report was not required for this SDG.

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 26 JUN 2017

Title: Data Validator

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133352**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:30	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735001

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-133352

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	164	ug/L	J	68	200	200	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-39-3	Barium	2570	ug/L		1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-42-8	Boron	22.6	ug/L	J	15	50	50	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-70-2	Calcium	19600	ug/L		50	200	200	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-89-6	Iron	106	ug/L		30	100	100	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7439-95-4	Magnesium	4710	ug/L		110	300	300	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-96-5	Manganese	7.92	ug/L	J	2	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7439-98-7	Molybdenum	0.812	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-09-7	Potassium	3210	ug/L		50	150	150	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:40	170609-6	1671589
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:31	170608-2	1671589
7440-23-5	Sodium	18200	ug/L		100	300	300	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-24-6	Strontium	143	ug/L		1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7440-31-5	Tin	2.64	ug/L	J	2.5	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:43	170608-5	1671589
7440-62-2	Vanadium	1.42	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:53	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:53	061417A-1	1671565

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133352**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	68.3	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735002**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-134176**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:32	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735002

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-134176

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-39-3	Barium	2500	ug/L		1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-42-8	Boron	21.3	ug/L	J	15	50	50	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-70-2	Calcium	19100	ug/L		50	200	200	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-89-6	Iron	41.8	ug/L	J	30	100	100	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7439-95-4	Magnesium	4580	ug/L		110	300	300	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-96-5	Manganese	5.48	ug/L	J	2	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7439-98-7	Molybdenum	0.850	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-02-0	Nickel	0.863	ug/L	J	0.6	2	2	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7440-09-7	Potassium	3140	ug/L		50	150	150	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:42	170609-6	1671589
7631-86-9	Silica	35600	ug/L		53	213	213	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:34	170608-2	1671589
7440-23-5	Sodium	17400	ug/L		100	300	300	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-24-6	Strontium	138	ug/L		1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:46	170608-5	1671589
7440-62-2	Vanadium	1.64	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:56	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:56	061417A-1	1671565

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735002**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-134176**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	66.5	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735003**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133281**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:34	061417W1-7	1673477

Prep Information:

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

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424735004**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133309**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/14/17 10:35	061417W1-7	1673477

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424735004

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-133309

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	400	ug/L		68	200	200	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-39-3	Barium	1840	ug/L		1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-70-2	Calcium	15900	ug/L		50	200	200	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-89-6	Iron	207	ug/L		30	100	100	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7439-95-4	Magnesium	4300	ug/L		110	300	300	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-96-5	Manganese	10.9	ug/L		2	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7439-98-7	Molybdenum	0.769	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-02-0	Nickel	0.672	ug/L	J	0.6	2	2	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7440-09-7	Potassium	2930	ug/L		50	150	150	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 17:44	170609-6	1671589
7631-86-9	Silica	37700	ug/L		53	213	213	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 18:37	170608-2	1671589
7440-23-5	Sodium	15000	ug/L		100	300	300	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-24-6	Strontium	111	ug/L		1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	06/09/17 00:49	170608-5	1671589
7440-62-2	Vanadium	1.05	ug/L	J	1	5	5	1	P	HSC	06/14/17 17:59	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 17:59	061417A-1	1671565

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2017-1647**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424735004**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133309**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	57.5	mg/L		0.453	1.24	1.24	1		TXT1	06/26/17 14:05		1677435

Prep Information:

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

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2017-1647

Contract: ESHL00114

Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1203805071	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	-4.22	ug/L	+/-10	J	P	3.3	10
1203805126	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203810085	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

*Analytical Methods:

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

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 424741001

Spike ID: 1203805074

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

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647 Client ID: CAPA-17-133353S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424741001 Spike ID: 1203805129

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.1		1	U	50	99.8		MS
Arsenic	ug/L	75-125	52		2	U	50	100		MS
Cadmium	ug/L	75-125	49.9		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	49.6		3	U	50	97.4		MS
Lead	ug/L	75-125	47.4		0.5	U	50	94.5		MS
Molybdenum	ug/L	75-125	51.9		0.948		50	102		MS
Nickel	ug/L	75-125	49.1		0.812	J	50	96.5		MS
Selenium	ug/L	75-125	47		2	U	50	92		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	43.9		0.6	U	50	87.8		MS
Uranium	ug/L	75-125	46.6		0.184	J	50	92.8		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2017-1647 Client ID CAWA-17-133278S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424596001 Spike ID: 1203810089

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.05		0.067	U	2	103		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 2017–1647

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–17–133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805073

Percent Solids for Dup: N/A

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

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1647

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805128

Percent Solids for Dup: N/A

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

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2017-1647**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAWA-17-133278D**Matrix:** WATER**Level:** Low**Sample ID:** 424596001**Duplicate ID:** 1203810087**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1647

Contract: ESHL00114

Aqueous LCS Source:OS2I

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203805072								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5070		101	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	520		104	80-120	P
	Iron	ug/L	5000	5120		102	80-120	P
	Magnesium	ug/L	5000	5170		103	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5150		103	80-120	P
	Silica	ug/L	10700	10600		99.1	80-120	P
	Sodium	ug/L	5000	5490		110	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	499		99.9	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	479		95.8	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1647

Contract: ESHL00114

Aqueous LCS Source: O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203805127								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	53.3		107	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	51.8		104	80-120	MS
	Lead	ug/L	50	49.5		99	80-120	MS
	Molybdenum	ug/L	50	49.8		99.6	80-120	MS
	Nickel	ug/L	50	51.9		104	80-120	MS
	Selenium	ug/L	50	51.2		102	80-120	MS
	Silver	ug/L	50	50.7		101	80-120	MS
	Thallium	ug/L	50	45.1		90.3	80-120	MS
	Uranium	ug/L	50	47.2		94.5	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2017-1647

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805075

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	664		679	J	2.358			P
Barium	56.6		57.7		1.911		10	P
Beryllium	1	U	5	U				P
Boron	17.3	J	75	U	52.718			P
Calcium	15700		16100		2.573		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	325		339	J	4.313			P
Magnesium	4110		4070		1.058			P
Manganese	2	U	10	U				P
Potassium	2930		3030		3.494		10	P
Silica	40500		40100		.913		10	P
Sodium	19600		20700		5.351		10	P
Strontium	95.7		98.4		2.825		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.28	J	5	U	135.167			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1647

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805130

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

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2017-1647 **Client ID:** CAWA-17-133278L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 424596001 **Serial Dilution ID:** 1203810091

<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 #: 2017-1647
Work Order #: 424735**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1671529

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805981	Method Blank (MB)
1203805982	Laboratory Control Sample (LCS)
1203805984	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805986	424739002(CAPA-17133356) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1671534	Method:	WSP-CN(T)
Prep Batch :	1671533	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
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203805008	Method Blank (MB)
1203805009	Laboratory Control Sample (LCS)
1203805010	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805012	424739002(CAPA-17133356) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are

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

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1671680

Method: WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805353	Method Blank (MB)
1203805354	Laboratory Control Sample (LCS)
1203805355	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805356	424735002(CAWA-17-134176) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS), 424735002 (CAWA-17-134176) and 424735004 (CAWA-17-133309) 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	424735	
	002	004
Chloride	2X	2X

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Manual Integrations

Samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS), 424735002

(CAWA-17-134176) and 424735004 (CAWA-17-133309) 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: 1671935 **Method:** NH3
Prep Batch : 1671933 **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
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806101	Method Blank (MB)
1203806102	Laboratory Control Sample (LCS)
1203806103	424741001(CAPA-17-133353) Sample Duplicate (DUP)
1203806104	424741001(CAPA-17-133353) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1671942	Method:	TKN
Prep Batch :	1671941	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
424735001	CAWA-17-133352
424735003	CAWA-17-133281
1203806126	Method Blank (MB)
1203806127	Laboratory Control Sample (LCS)
1203806128	424741002(CAPA-17-133355) Sample Duplicate (DUP)
1203806129	424741002(CAPA-17-133355) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424741002 (CAPA-17-133355) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203806126 (MB) and 1203806127 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1671832

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805863	Method Blank (MB)
1203805864	Laboratory Control Sample (LCS)
1203805866	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805867	424853003(NonSDG) Sample Duplicate (DUP)
1203805871	424735002(CAWA-17-134176) Post Spike (PS)
1203805872	424853003(NonSDG) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1671937	Method:	PO4
Prep Batch :	1671936	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
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806112	Method Blank (MB)
1203806113	Laboratory Control Sample (LCS)
1203806120	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203806121	424735002(CAWA-17-134176) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1672860

Method: TDS

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203808586	Method Blank (MB)
1203808587	Laboratory Control Sample (LCS)
1203808588	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1671823

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Calibration Verification Information

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

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1671988 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806295	Laboratory Control Sample (LCS)
1203806296	424596002(CAWA-17-133306) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

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

Sample	Analyte	Value
1203806296 (CAWA-17-133306DUP)	pH	Received 02-JUN-17, out of holding 31-MAY-17
424735002 (CAWA-17-134176)	pH	Received 06-JUN-17, out of holding 02-JUN-17
424735004 (CAWA-17-133309)	pH	Received 06-JUN-17, out of holding 02-JUN-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

A data exception report (DER) 1640886 was generated for samples 424735002 (CAWA-17-134176), 424735004 (CAWA-17-133309) and 1203806296 (CAWA-17-133306DUP) in this SDG/batch.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Alkalinity

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

Sample Analysis

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

Sample ID	Client ID
424735002	CAWA-17-134176
424735004	CAWA-17-133309
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

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

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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: 2017-1647 GEL Work Order: 424735

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 22 JUN 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene
Project: LANL- WQH Water Samples

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133352
Sample ID: 424735001
Matrix: W
Collect Date: 02-JUN-17 09:59
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		3.68	0.330	1.00	mg/L		1	TSM	06/09/17	0136	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0958	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.322	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1502	1671942	3

The following Prep Methods were performed:

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

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-134176
Sample ID: 424735002
Matrix: W
Collect Date: 02-JUN-17 09:59
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/06/17	2014	1671680	1
Fluoride		0.161	0.033	0.100	mg/L		1					
Sulfate		7.13	0.133	0.400	mg/L		1					
Chloride		15.2	0.134	0.400	mg/L		2	MXL2	06/08/17	0354	1671680	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0716	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1005	1671935	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite	J	0.0222	0.017	0.050	mg/L		1	AXH3	06/09/17	0958	1671832	4
PO4 "As Received"												
Phosphorus, Total as P		0.0744	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1319	1671937	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		141	3.40	14.3	mg/L			KLP1	06/09/17	1546	1672860	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		79.0	1.45	4.00	mg/L			RXB5	06/09/17	1336	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		261	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 10.2C	H	7.95	0.010	0.100	SU		1	RXB5	06/09/17	1334	1671988	9

The following Prep Methods were performed:

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

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-134176
Sample ID: 424735002

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Client SDG: 2017-1647

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-133281

Project: ESHL00114

Sample ID: 424735003

Client ID: ARSL004

Matrix: W

Collect Date: 02-JUN-17 12:27

Receive Date: 06-JUN-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.98	0.330	1.00	mg/L		1	TSM	06/09/17	0223	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	0959	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.204	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1503	1671942	3

The following Prep Methods were performed:

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

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: June 22, 2017

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133309
Sample ID: 424735004
Matrix: W
Collect Date: 02-JUN-17 12:27
Receive Date: 06-JUN-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/06/17	2141	1671680	1
Fluoride		0.161	0.033	0.100	mg/L		1					
Sulfate		8.54	0.133	0.400	mg/L		1					
Chloride		9.44	0.134	0.400	mg/L		2	MXL2	06/08/17	0521	1671680	2
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.130	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1006	1671935	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.0966	0.017	0.050	mg/L		1	AXH3	06/09/17	1002	1671832	4
PO4 "As Received"												
Phosphorus, Total as P		0.0547	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1321	1671937	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		139	3.40	14.3	mg/L			KLP1	06/09/17	1546	1672860	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		69.8	1.45	4.00	mg/L			RXB5	06/09/17	1339	1671987	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		184	1.00	1.00	umhos/cm		1	VH1	06/08/17	1059	1671823	8
PH "As Received"												
pH at Temp 10.1C	H	7.14	0.010	0.100	SU		1	RXB5	06/09/17	1337	1671988	9

The following Prep Methods were performed:

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

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Certificate of Analysis

Report Date: June 22, 2017

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

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

Client SDG: 2017-1647

Client Sample ID: CAWA-17-133309
Sample ID: 424735004

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 22, 2017

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

Contact: Mr. Keith Greene

Workorder: 424735

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

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QC Summary

Workorder: 424735

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

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QC Summary

Workorder: 424735

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

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QC Summary

Workorder: 424735

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1671937										
QC1203806113	LCS										
Phosphorus, Total as P	1.00			0.848	mg/L		84.8	(80%-124%)	KLP1	06/09/17	13:07
QC1203806112	MB										
Phosphorus, Total as P			U	ND	mg/L					06/09/17	13:06
QC1203806121	424735002	MS									
Phosphorus, Total as P	1.00	0.0744		1.03	mg/L		95.6	(63%-139%)		06/09/17	13:21
Batch	1671942										
QC1203806128	424741002	DUP									
Nitrogen, Total Kjeldahl		0.336		0.308	mg/L	8.7	^	(+/-0.100)	KLP1	06/09/17	15:06
QC1203806127	LCS										
Nitrogen, Total Kjeldahl	1.00			0.953	mg/L		95.3	(90%-110%)		06/09/17	15:14
QC1203806126	MB										
Nitrogen, Total Kjeldahl			J	0.0715	mg/L					06/09/17	15:13
QC1203806129	424741002	MS									
Nitrogen, Total Kjeldahl	1.00	0.336		1.35	mg/L		101	(90%-110%)		06/09/17	15:07
Solids Analysis											
Batch	1672860										
QC1203808588	424735002	DUP									
Total Dissolved Solids		141		139	mg/L	2.04		(0%-5%)	KLP1	06/09/17	15:46
QC1203808587	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		06/09/17	15:46
QC1203808586	MB										
Total Dissolved Solids			U	ND	mg/L					06/09/17	15:46

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QC Summary

Workorder: 424735

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

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

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QC Summary

Workorder: 424735

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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.

Miscellaneous

DATA EXCEPTION REPORT

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

Originator's Name:

Rachael Bell 10-JUN-17

Data Validator/Group Leader:

Elzbieta Szulc 12-JUN-17

Originator's Name:

Rachael Bell 10-JUN-17

Data Validator/Group Leader:

Elzbieta Szulc 12-JUN-17