



### SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102574

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	08/11/2015	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1211	↓	MEDIA:	UA	↓
PRS ID:	ok	↓	SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-13	↓	FIELD PREP:	UF	ok
LOCATION TYPE:	MON	↓	FIELD QC TYPE:	REG	↓
TOP DEPTH:	ok	↓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / (NO) / NA	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
↓	WSP-CN(T)	250 ML POLY	1	NAOH	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

**SAMPLE COMMENTS:**

**LOCATION COMMENTS:**  
*mf diesel generator running 40' away*

**FIELD PARAMETERS:**

Dissolved Oxygen	<u>6.7</u>	mg/L	Flow (in gpm)	<u>5.66</u>	GPM	Oxidation-Reduction Potential	<u>121.8</u>	mV
pH	<u>8.18</u>	SU	Specific Conductance	<u>146</u>	uS/cm	Temperature	<u>22.10</u>	deg C
Turbidity	<u>1.00</u>	NTU						

**COLLECTED BY (PRINT):** *A. Tosh*

RELINQUISHED BY (Printed Name) <i>Andrew Flocke</i> (Signature)	Date/Time 8/11/15 1325	RECEIVED BY (Printed Name) <i>K. G. Carr</i> (Signature)	Date/Time 8/11/15 1:25
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

### SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102590

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-11-15	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1428	↓	MEDIA:	UA	↓
PRS ID:	OK	↓	SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-61 S1	↓	FIELD PREP:	UF	OK
LOCATION TYPE:	MON	↓	FIELD QC TYPE:	REG	↓
TOP DEPTH:	OK	↓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / NO / <u>NA</u>	

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

SAMPLE COMMENTS: NA

LOCATION COMMENTS: Sampled 50 ft from diesel generator

**FIELD PARAMETERS:**

Dissolved Oxygen	<u>1.58</u>	mg/L	Flow (in gpm)	<u>2.04</u>	GPM	Oxidation-Reduction Potential	<u>-47.3</u>	mV
pH	<u>6.32</u>	SU	Specific Conductance	<u>201</u>	uS/cm	Temperature	<u>22.24</u>	deg C
Turbidity	<u>0.7</u>	NTU						

COLLECTED BY (PRINT): M. Shenda & D. Jaramillo

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 8-11-15 1520	RECEIVED BY (Printed Name) (Signature)	Date/Time 8/11/15 1520
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102598

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	08/11/2015	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1211	↓	MEDIA:	UA	↓
PRS ID:	ok	↓	SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-13	↓	FIELD PREP:	F	ok
LOCATION TYPE:	MON	↓	FIELD QC TYPE:	REG	↓
TOP DEPTH:	ok	↓	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	↓	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:

Dissolved Oxygen \_\_\_\_\_ mg/L      Flow (in gpm) \_\_\_\_\_ GPM      Oxidation-Reduction Potential \_\_\_\_\_ mV  
 pH \_\_\_\_\_ SU      Specific Conductance \_\_\_\_\_ uS/cm      Temperature \_\_\_\_\_ deg C  
 Turbidity \_\_\_\_\_ NTU

AS 8/11/15

COLLECTED BY (PRINT): *A. Tush*

RELINQUISHED BY (Printed Name) (Signature)	<i>Andrew Tush</i>	Date/Time <i>8/11/15</i> <i>1325</i>	RECEIVED BY (Printed Name) (Signature)	<i>K. Green</i>	Date/Time <i>8/11/15</i> <i>1:25</i>
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/31/2015

### SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 10310

EVENT NAME: Mortandad/Sandia (Chromium and General Surveillance)  
MY2015 Q4 Watershed Sampling\_Mortandad

SAMPLE ID: CAMO-15-102614

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	8-11-15	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1428	↓	MEDIA:	UA	↓
PRS ID:	OK	↓	SAMPLE TECH CODE:	UA	GSP
LOCATION ID:	R-61 S1	↓	FIELD PREP:	F	OK
LOCATION TYPE:	MON	↓	FIELD QC TYPE:	REG	↓
TOP DEPTH:	OK	↓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:	YES / NO / <u>NA</u>	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
↓	WSP-CR52/53	1 LITER POLY	1	ICE	↓	↓
↓	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE	↓	↓
↓	WSP-NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

8-11-15 *JB*

Dissolved Oxygen	_____	mg/L	Flow (in gpm)	_____	GPM	Oxidation-Reduction Potential	_____	mV
pH	_____	SU	Specific Conductance	_____	uS/cm	Temperature	_____	deg C
Turbidity	_____	NTU						

COLLECTED BY (PRINT): M. Stendo & D. Saramino

RELINQUISHED BY (Printed Name) <i>Tanner Bonham</i> (Signature)	Date/Time 8-11-15 1520	RECEIVED BY (Printed Name) <i>M. Stendo</i> (Signature)	Date/Time 8/11/15 1520
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## DATA VALIDATION REPORT

Chain Of Custody No. 2015-2137

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
379268	EPA:120.1	2				
379268	EPA:150.1	2				
379268	EPA:160.1	2				
379268	EPA:245.2	4				
379268	EPA:300.0	2				
379268	EPA:310.1	2				
379268	EPA:335.4	2				
379268	EPA:350.1	2				
379268	EPA:351.2	2				
379268	EPA:353.2	2				
379268	EPA:365.4	2				
379268	SM:A2340B	3				
379268	SW-846:6010C	3				
379268	SW-846:6020	3				
379268	SW-846:6850	2				
379268	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	
379268	EPA:120.1	1501375	1501375	1										1				2				
379268	EPA:120.1	1504613	1504613	1										1				1				
379268	EPA:150.1	1501372	1501372	1										1				2				
379268	EPA:150.1	1502200	1502200	1										1				1				
379268	EPA:160.1	1500472	1500472	2					1					1				1				
379268	EPA:245.2	1502887	1502885	4					1	1				1				1				
379268	EPA:300.0	1500349	1500349	2					1					1				1				
379268	EPA:310.1	1500640	1500640	2					1	1				1				1				

## DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
379268	EPA:335.4	1500327	1500325		2				1	1				1			1				
379268	EPA:350.1	1500587	1500585		2				1	2				1			2				
379268	EPA:351.2	1500575	1500574		2				1	1				1			1				
379268	EPA:353.2	1499852	1499852		2				1					1			1				
379268	EPA:365.4	1500565	1500564		2				1	1				1			1				
379268	SM:A2340B	1501953	1501953		1																
379268	SM:A2340B	1503257	1503257		2																
379268	SW-846:6010C	1500220	1500219		3				1	1				1			1				
379268	SW-846:6020	1500234	1500233		3				1	1				1			1				
379268	SW-846:6850	1500488	1500487		2				1	1	1			1							
379268	SW-846:9060	1500883	1500883		2				1					1			1				

### 2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-15-102607	1203376811	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-15-102655	1203385407	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-15-102657	1203376810	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203376809	LCS	0	0	1	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203385406	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102607	1203376805	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102614	1203378974	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-15-102657	1203376806	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203376804	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203378973	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102598	1203374441	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-15-102614	379268004	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:160.1	GENERAL CHEMISTRY	LCS	1203374440	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203374439	MB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102569	1203380952	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102569	1203380954	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-15-102574	379268001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102590	379268003	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203380951	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203380950	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203374082	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203374081	MB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	WSTSIP-15-103065	1203374083	DUP	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-15-102657	1203374904	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-15-102657	1203374907	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203374902	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203374900	MB	2	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102574	379268001	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAMO-15-102590	379268003	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203374008	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203374007	MB	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WSTSIP-15-103065	1203374009	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	WSTSIP-15-103065	1203374012	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102598	1203374764	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102598	1203374766	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-15-102650	1203374763	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-15-102650	1203374765	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203374762	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203374761	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102574	379268001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102590	379268003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102738	1203374726	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-15-102738	1203374727	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203374725	LCS	0	0	1	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	MB	1203374724	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-15-102652	1203372752	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203372751	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203372750	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102598	379268002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-15-102614	379268004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-15-102657	1203374698	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CASA-15-102657	1203374700	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203374696	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203374695	MB	1	0	0	0
SM:A2340B	INORGANIC	CAMO-15-102590	379268003	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-15-102598	379268002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-15-102614	379268004	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102590	379268003	REG	16	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102598	379268002	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-15-102614	379268004	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203373769	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203373768	MB	17	0	0	0
SW-846:6010C	INORGANIC	WST09-15-103883	1203373770	DUP	17	0	0	0
SW-846:6010C	INORGANIC	WST09-15-103883	1203373771	MS	0	0	17	0
SW-846:6020	INORGANIC	CAMO-15-102590	379268003	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-15-102598	379268002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-15-102614	379268004	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203373808	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203373807	MB	11	0	0	0
SW-846:6020	INORGANIC	WST09-15-103883	1203373809	DUP	11	0	0	0
SW-846:6020	INORGANIC	WST09-15-103883	1203373810	MS	0	0	11	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102559	1203374487	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102559	1203374488	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102598	379268002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-15-102614	379268004	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203374486	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203374485	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102574	379268001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102583	1203375544	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-15-102590	379268003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203375542	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203375541	MB	1	0	0	0

## DATA VALIDATION REPORT

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	1203373768	METHOD BLANK	SW-846:6010C	W	Sodium	178	J	ug/L	300

No.

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
WSTSIP-15-103065	1203374012		EPA:335.4	Cyanide (Total)	1500325	08-20-2015	W	63.8		110	90	10		
CASA-15-102650	1203374765		EPA:350.1	Ammonia as Nitrogen	1500585	08-20-2015	W	118		110	90	10		
WST09-15-103883	1203373771		SW-846:6010C	Sodium	1500219	08-17-2015	W	47.4		125	75			

## DATA VALIDATION REPORT

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
WST09-15-103883	1203373810		SW-846:6020	Thallium	1500233	08-19-2015	W	68.5		125	75	10		

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**

J\_LAB

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

NQ

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

## DATA VALIDATION REPORT

**Reason Code**

**Description**

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
CAMO-15-102574	R-13	REG	EPA:245.2	0	1
CAMO-15-102574	R-13	REG	EPA:335.4	0	1
CAMO-15-102574	R-13	REG	EPA:351.2	0	1
CAMO-15-102574	R-13	REG	SW-846:9060	0	1
CAMO-15-102590	R-61 S2	REG	EPA:245.2	0	1
CAMO-15-102590	R-61 S2	REG	EPA:335.4	0	1
CAMO-15-102590	R-61 S2	REG	EPA:351.2	0	1
CAMO-15-102590	R-61 S2	REG	SM:A2340B	0	1
CAMO-15-102590	R-61 S2	REG	SW-846:6010C	0	16
CAMO-15-102590	R-61 S2	REG	SW-846:6020	0	11
CAMO-15-102590	R-61 S2	REG	SW-846:9060	0	1
CAMO-15-102598	R-13	REG	EPA:120.1	0	1
CAMO-15-102598	R-13	REG	EPA:150.1	0	1
CAMO-15-102598	R-13	REG	EPA:160.1	0	1
CAMO-15-102598	R-13	REG	EPA:245.2	0	1
CAMO-15-102598	R-13	REG	EPA:300.0	0	4
CAMO-15-102598	R-13	REG	EPA:310.1	0	2
CAMO-15-102598	R-13	REG	EPA:350.1	0	1
CAMO-15-102598	R-13	REG	EPA:353.2	0	1
CAMO-15-102598	R-13	REG	EPA:365.4	0	1
CAMO-15-102598	R-13	REG	SM:A2340B	0	1
CAMO-15-102598	R-13	REG	SW-846:6010C	0	17
CAMO-15-102598	R-13	REG	SW-846:6020	0	11
CAMO-15-102598	R-13	REG	SW-846:6850	0	1
CAMO-15-102614	R-61 S2	REG	EPA:120.1	0	1
CAMO-15-102614	R-61 S2	REG	EPA:150.1	0	1
CAMO-15-102614	R-61 S2	REG	EPA:160.1	0	1
CAMO-15-102614	R-61 S2	REG	EPA:245.2	0	1
CAMO-15-102614	R-61 S2	REG	EPA:300.0	0	4
CAMO-15-102614	R-61 S2	REG	EPA:310.1	0	2
CAMO-15-102614	R-61 S2	REG	EPA:350.1	0	1

### DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-15-102614	R-61 S2	REG	EPA:353.2	0	1
CAMO-15-102614	R-61 S2	REG	EPA:365.4	0	1
CAMO-15-102614	R-61 S2	REG	SM:A2340B	0	1
CAMO-15-102614	R-61 S2	REG	SW-846:6010C	0	17
CAMO-15-102614	R-61 S2	REG	SW-846:6020	0	11
CAMO-15-102614	R-61 S2	REG	SW-846:6850	0	1



September 08, 2015

[gel.com](http://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: 379268  
SDG: 2015-2137

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on August 13, 2015, and analyzed for 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,

Hope Taylor for  
Valerie Davis  
Project Manager

Chain of Custody: 2015-2137  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 379268**  
**SDG: 2015-2137**

## Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	10
Perchlorates by LCMSMS Analysis.....	13
Case Narrative.....	14
Sample Data Summary.....	20
Quality Control Summary.....	23
Quality Control Data.....	26
Metals Analysis.....	32
Case Narrative.....	33
Sample Data Summary.....	39
Quality Control Summary.....	50
Miscellaneous.....	65
General Chem Analysis.....	67
Case Narrative.....	68
Sample Data Summary.....	99
Quality Control Summary.....	106
Miscellaneous.....	112

# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 379268  
SDG # : 2015-2137**

**September 08, 2015**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 13, 2015 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>
379268001	CAMO-15-102574
379268002	CAMO-15-102598
379268003	CAMO-15-102590
379268004	CAMO-15-102614

**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: 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.

top a d

Hope Taylor for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 08 September 2015**

<b>State</b>	<b>Certification</b>
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
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	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

# **Chain of Custody and Supporting Documentation**



SAMPLE RECEIPT & REVIEW FORM

Client: LANL		SDG/AR/COC/Work Order: 2015-2137	
Received By: Brielle Luthman		Date Received: 8/13/15 0845	
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		/	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): $\phi$
Classified Radioactive II or III by RSO?		/	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		/	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		/	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		/	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		/	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	/			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	/			Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	/			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): E5032015835
3 Chain of custody documents included with shipment?	/			
4 Sample containers intact and sealed?	/			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	/			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples (EPA 6850) have headspace as required?	/			Sample ID's and containers affected:
7 VOA vials free of headspace (defined as < 6mm bubble)?	/			Sample ID's and containers affected:
8 Are Encore containers present?			/	(If yes, immediately deliver to Volatiles laboratory)
9 Samples received within holding time?	/			ID's and tests affected:
10 Sample ID's on COC match ID's on bottles?	/			Sample ID's and containers affected:
11 Date & time on COC match date & time on bottles?	/			Sample ID's affected:
12 Number of containers received match number indicated on COC?	/			Sample ID's affected:
13 Are sample containers identifiable as GEL provided?			/	
14 COC form is properly signed in relinquished/received sections?	/			
15 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 5908 1779 3201-3° 5908 1779 3212-4° 5908 1779 3197-4°

Comments (Use Continuation Form if needed):

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

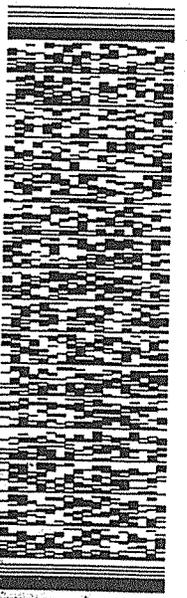
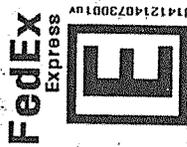
SHIP DATE: 12AUG15  
ACTWGT: 58.0 LB MAN  
CAD: 0014176/CAFE2807

BILL SENDER  
LOS ALAMOS, NM 87545  
UNITED STATES US

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407  
(843) 566-8171  
REF: MRCH08BF4MCO

521C1/FECA/6F03

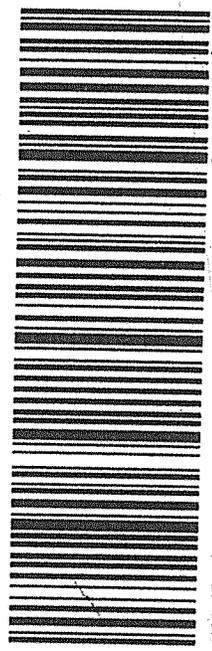


THU - 13 AUG 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1779 3212

X7 CHSA 4

29407  
SC-US CHS



Part # 156148-434 RIT2 10/11

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

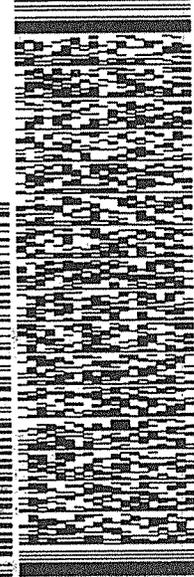
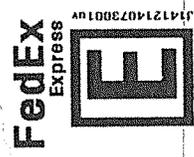
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ACTWGT: 44.0 LB MAN  
CAD: 0014176/CAFE2807

BILL SENDER  
LOS ALAMOS, NM 87545  
UNITED STATES US

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407  
(843) 566-8171  
REF: MRCH08BF4MCO

521C1/FECA/6F03

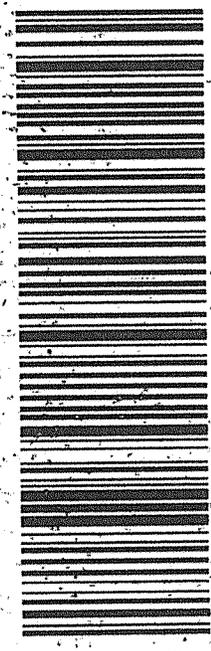


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PRIORITY OVERNIGHT

2 of 2  
MPS# 5908 1779 3201  
0263

Mstr# 5908 1779 3197  
X7 CHSA

3  
29407  
SC-US CHS



Part # 156148-434 RIT2 10/11

ORIGIN ID: SAFA (505) 665-9866  
KEITH GREENE  
LOS ALAMOS NATL LAB  
TAOO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 12AUG15  
ACTWT: 49.0 LB MAN  
CAD: 0014176/CAFE2807

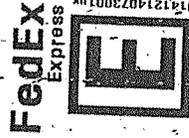
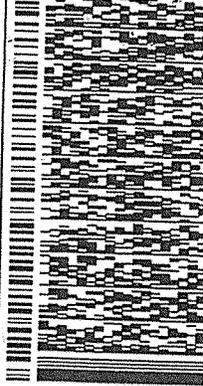
BILL SENDER

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

**CHARLESTON SC 29407**

(843) 566-8171

REF: MRCH08BF4MCO



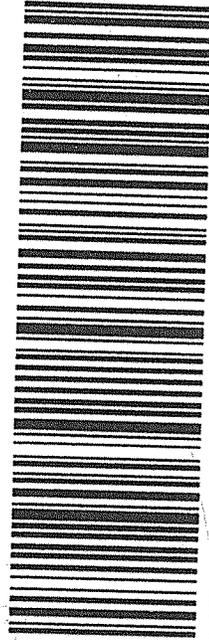
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PRIORITY OVERNIGHT

1 of 2  
TRK# 5908 1779 3197  
## MASTER ##

**X7 CHSA**

**4**

29407  
SC-US CHS



Part # 156148-434 R1T2 10/11

97  
13

521C1/FECA/6F03

# **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 #: 2015-2137  
Work Order #: 379268**

**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: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1500488

Prep Batch Number: 1500487

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374489	Interference Check Sample (ICS)
1203374485	Method Blank (MB)
1203374486	Laboratory Control Sample (LCS)
1203374487	379019004(CAMO-15-102559) Matrix Spike (MS)
1203374488	379019004(CAMO-15-102559) 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# 12.

## **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 379019004 (CAMO-15-102559) 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.

### **Retention Time Standard Area Acceptance**

The retention time 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 Method 332.0, 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**

The 1203374486 (LCS) was re-analyzed due to non-conforming spike recoveries in the initial analysis. The re-analysis met acceptance criteria, and the data 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.

##### **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 not internally corrected for using Perchlorate-O (18). They are external calibrations.

##### **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: 2015-2137 GEL Work Order: 379268

### 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, 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: 19 AUG 2015

Title: Group Leader

# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

CAMO-15-102598Lab Code: GELDate Received: 13-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: SW846 6850 ModifiedGEL Sample ID: 379268002Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.400	ug/L		1	15-AUG-15 03:11	per0814038a
	Perchlorate Isotope Ratio			3.09			1	15-AUG-15 03:11	per0814038a
14797-73-0	Perchlorate-101	.05	.2	0.400	ug/L		1	15-AUG-15 03:11	per0814038a
	Perchlorate-O(18)			0.480	ug/L		1	15-AUG-15 03:11	per0814038a

^ 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 =  
Instrument Value X  $\frac{\text{Concentrated Extract Volume}}{\text{Aliquot}}$  X  $\frac{1}{\% \text{Solids}}$

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

CAMO-15-102614Lab Code: GELDate Received: 13-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: SW846 6850 ModifiedGEL Sample ID: 379268004Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.195	ug/L	J	1	15-AUG-15 03:23	per0814039a
	Perchlorate Isotope Ratio			3.12			1	15-AUG-15 03:23	per0814039a
14797-73-0	Perchlorate-101	.05	.2	0.193	ug/L	J	1	15-AUG-15 03:23	per0814039a
	Perchlorate-O(18)			0.481	ug/L		1	15-AUG-15 03:23	per0814039a

^ 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**

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**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2015-2137

**Extract Batch Code:** 1500487

**Date Filtered:** 14-AUG-15

**Matrix:** WATER

**Sample ID:** 1203374486

Analyte <sup>^</sup>	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.195	ug/L	97.5		85 - 115
Perchlorate Isotope Ratio		3.04				-
Perchlorate-101	0.200	.203	ug/L	102		85 - 115
Perchlorate-O(18)		.463	ug/L			-

<sup>^</sup> 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):** 2015-2137

**Extract Batch Code:** 1500487

**Date Extracted:** 14-AUG-15

**GEL MS/PS ID:** 1203374487

**Client ID:** CAMO-15-102559

**GEL MSD/PSD ID:** 1203374488

**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	0.404	ug/L	0.591	93.5	.566	81.2	4.27	30	75 - 125
Perchlorate Isotope Ratio	0	3.18		3.14		3		4.64		-
Perchlorate-101	0.200	0.393	ug/L	0.581	94.3	.584	95.4	.362	30	75 - 125
Perchlorate-O(18)	0	0.479	ug/L	0.480		.49		2.11		-

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

# Quality Control Data

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample No.

MBLab Code: GELDate Received: 14-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: EPA 6850 ModifiedGEL Sample ID: 1203374485Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	14-AUG-15 21:34	per0814012a
	Perchlorate Isotope Ratio						1	14-AUG-15 21:34	per0814012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	14-AUG-15 21:34	per0814012a
	Perchlorate-O(18)			0.486	ug/L		1	14-AUG-15 21:34	per0814012a

^ 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 LLC

Client Sample No.

LCSLab Code: GELDate Received: 14-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: EPA 6850 ModifiedGEL Sample ID: 1203374486Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.195	ug/L	J	1	15-AUG-15 13:21	per0815012a
	Perchlorate Isotope Ratio			3.04			1	15-AUG-15 13:21	per0815012a
14797-73-0	Perchlorate-101	.05	.2	0.203	ug/L		1	15-AUG-15 13:21	per0815012a
	Perchlorate-O(18)			0.463	ug/L		1	15-AUG-15 13:21	per0815012a

^ 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 LLC

Client Sample No.

ICSLab Code: GEL

Date Received:

Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: SW846 6850 ModifiedGEL Sample ID: 1203374489Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids:

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.241	ug/L		1	14-AUG-15 22:00	per0814014a
	Perchlorate Isotope Ratio			3.09			1	14-AUG-15 22:00	per0814014a
14797-73-0	Perchlorate-101	.05	.2	0.241	ug/L		1	14-AUG-15 22:00	per0814014a
	Perchlorate-O(18)			0.514	ug/L		1	14-AUG-15 22:00	per0814014a

^ 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 LLC

Client Sample No.

CAMO-15-102559MSLab Code: GELDate Received: 11-AUG-15Instrument: LCMSMSGEL Job No (SDG): 2015-2137Method: SW846 6850 ModifiedGEL Sample ID: 1203374487Matrix: WATERDate Filtered: 14-AUG-15Extraction Batch ID: 1500487Injection Volume (uL): 20Extraction Type: Filter/DAISample Volume/Weight: 10.0 mL

%Solids: .

Concentrated Extract Volume: 10.0

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.591	ug/L		1	14-AUG-15 23:04	per0814019a
	Perchlorate Isotope Ratio			3.14			1	14-AUG-15 23:04	per0814019a
14797-73-0	Perchlorate-101	.05	.2	0.581	ug/L		1	14-AUG-15 23:04	per0814019a
	Perchlorate-O(18)			0.480	ug/L		1	14-AUG-15 23:04	per0814019a

^ 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: 1500487Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-15-102559MSDDate Received: 11-AUG-15GEL Job No (SDG): 2015-2137GEL Sample ID: 1203374488Date Filtered: 14-AUG-15Injection 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	0.566	ug/L		1	14-AUG-15 23:17	per0814020a
	Perchlorate Isotope Ratio			3			1	14-AUG-15 23:17	per0814020a
14797-73-0	Perchlorate-101	.05	.2	0.584	ug/L		1	14-AUG-15 23:17	per0814020a
	Perchlorate-O(18)			0.490	ug/L		1	14-AUG-15 23:17	per0814020a

^ 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 =

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

# **Metals Analysis**

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2015-2137**  
**Work Order #: 379268**

<b>Sample ID</b>	<b>Client ID</b>
379268001	CAMO-15-102574
379268002	CAMO-15-102598
379268003	CAMO-15-102590
379268004	CAMO-15-102614
1203373768	Method Blank (MB) <b>ICP</b>
1203373769	Laboratory Control Sample (LCS)
1203373772	379221001(WST09-15-103883L) Serial Dilution (SD)
1203373770	379221001(WST09-15-103883D) Sample Duplicate (DUP)
1203373771	379221001(WST09-15-103883S) Matrix Spike (MS)
1203373807	Method Blank (MB) <b>ICP-MS</b>
1203373808	Laboratory Control Sample (LCS)
1203373811	379221001(WST09-15-103883L) Serial Dilution (SD)
1203373809	379221001(WST09-15-103883D) Sample Duplicate (DUP)
1203373810	379221001(WST09-15-103883S) Matrix Spike (MS)
1203377940	379221001(WST09-15-103883PS) Post Spike (PS)
1203380950	Method Blank (MB) <b>CVAA</b>
1203380951	Laboratory Control Sample (LCS)
1203380956	379330002(CAMO-15-102569L) Serial Dilution (SD)
1203380952	379330002(CAMO-15-102569D) Sample Duplicate (DUP)
1203380954	379330002(CAMO-15-102569S) Matrix Spike (MS)

**Sample Analysis**

**Method/Analysis Information**

<b>Analytical Batch:</b>	1500220, 1500234, 1502887, 1501953 and 1503257
<b>Prep Batch :</b>	1500219, 1500233 and 1502885
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 24, GL-MA-E-006 REV# 12, GL-MA-E-014 REV# 26, GL-MA-E-010 REV# 30 and GL-GC-E-107 REV# 9
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

**Preparation/Analytical Method Verification**

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

## **System Configuration**

The Hardness as CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

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

The Metals analysis-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.

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

## **Calibration Information**

### **Instrument Calibration**

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

### **CRDL/PQL Requirements**

The PQL standard recoveries for SW846 6010C met the control limits with the exception of sodium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 379268002 (CAMO-15-102598), 379268003 (CAMO-15-102590) and 379268004 (CAMO-15-102614)-ICP.

### **ICSA/ICSAB Statement**

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

### **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 (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: 379221001 (WST09-15-103883)-ICP and ICP-MS and 379330002 (CAMO-15-102569)-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 MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1203373810 (WST09-15-103883MS)	Thallium	68.5* (75%-125%)

**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.

**Post Spike (PS) Recovery Statement**

The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences in the post-digested sample.

**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 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 (DER) was generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) 1441223 was generated for sample 1203373810 (WST09-15-103883MS) in this SDG/batch.

**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: 2015-2137 GEL Work Order: 379268

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

- \* A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- U Analyte was analyzed for, but not detected above the MDL, MDA, 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: 09 SEP 2015**

**Title: Data Validator**

# Sample Data Summary

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:** EPA

**SAMPLE ID:**379268001

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102574

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	08/26/15 11:52	082615W1-5	1502887

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1502887	1502885	EPA 245.1/245.2 Prep	20	mL	20	mL	08/25/15	AXS5

**\*Analytical Methods:**

AV EPA 245.1/245.2

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:** EPA

**SAMPLE ID:** 379268002

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102598

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	MTMI	08/26/15 11:54	082615W1-5	1502887

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

SDG No: 2015-2137

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379268002

BASIS: As Received

DATE COLLECTED 11-AUG-15

CLIENT ID: CAMO-15-102598

LEVEL: Low

DATE RECEIVED 13-AUG-15

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	08/17/15 21:26	081715A-1	1500220
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	08/20/15 12:56	150820-4	1500234
7440-38-2	Arsenic	1.85	ug/L	J	1.7	5	5	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7440-39-3	Barium	26.8	ug/L		1	5	5	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7440-70-2	Calcium	14200	ug/L		50	200	200	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-47-3	Chromium	3.81	ug/L	J	2	10	10	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7439-95-4	Magnesium	3640	ug/L		110	300	300	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7439-98-7	Molybdenum	1.03	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/21/15 13:13	150821-2	1500234
7440-02-0	Nickel	2	ug/L	U	0.5	2	2	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7440-09-7	Potassium	1330	ug/L		50	150	150	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7631-86-9	Silica	70100	ug/L		53	213	213	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	PRB	08/20/15 12:56	150820-4	1500234
7440-23-5	Sodium	9920	ug/L		100	300	300	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-24-6	Strontium	50.5	ug/L		1	5	5	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	PRB	08/19/15 19:44	150819-3	1500234
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-61-1	Uranium	0.425	ug/L		0.067	0.2	0.2	1	MS	PRB	08/20/15 12:56	150820-4	1500234
7440-62-2	Vanadium	5	ug/L		1	5	5	1	P	HSC	08/17/15 21:26	081715A-1	1500220
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	08/17/15 21:26	081715A-1	1500220

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:**

**SAMPLE ID:**379268002

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102598

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	50.3	mg/L		0.453	1.24	1.24	1		JJ2	08/26/15 12:52		1503257

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1500220	1500219	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1500234	1500233	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1502887	1502885	EPA 245.1/245.2 Prep	20	mL	20	mL	08/25/15	AXS5

**\*Analytical Methods:**

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

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:** EPA

**SAMPLE ID:**379268003

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102590

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	MTMI	08/26/15 11:56	082615W1-5	1502887

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

SDG No: 2015-2137

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379268003

BASIS: As Received

DATE COLLECTED 11-AUG-15

CLIENT ID: CAMO-15-102590

LEVEL: Low

DATE RECEIVED 13-AUG-15

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	75.5	ug/L	J	68	200	200	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	08/20/15 12:58	150820-4	1500234
7440-38-2	Arsenic	3.5	ug/L	J	1.7	5	5	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-39-3	Barium	15.6	ug/L		1	5	5	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-42-8	Boron	35.2	ug/L	J	15	50	50	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-70-2	Calcium	9050	ug/L		50	200	200	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-47-3	Chromium	10	ug/L	U	2	10	10	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7439-89-6	Iron	2650	ug/L		30	100	100	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7439-95-4	Magnesium	3820	ug/L		110	300	300	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7439-96-5	Manganese	171	ug/L		2	10	10	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7439-98-7	Molybdenum	3.48	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/21/15 13:15	150821-2	1500234
7440-02-0	Nickel	1.17	ug/L	J	0.5	2	2	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-09-7	Potassium	11500	ug/L		50	150	150	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	PRB	08/20/15 12:58	150820-4	1500234
7440-23-5	Sodium	17700	ug/L		100	300	300	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-24-6	Strontium	40.9	ug/L		1	5	5	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	PRB	08/19/15 19:46	150819-3	1500234
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	08/20/15 12:58	150820-4	1500234
7440-62-2	Vanadium	3.67	ug/L	J	1	5	5	1	P	HSC	08/17/15 21:29	081715A-1	1500220
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	08/17/15 21:29	081715A-1	1500220

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:**

**SAMPLE ID:**379268003

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102590

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	38.3	mg/L		0.453	1.24	1.24	1		JJ2	08/20/15 10:45		1501953

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1500220	1500219	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1500234	1500233	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1502887	1502885	EPA 245.1/245.2 Prep	20	mL	20	mL	08/25/15	AXS5

**\*Analytical Methods:**

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

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:** EPA

**SAMPLE ID:**379268004

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102614

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	MTMI	08/26/15 11:57	082615W1-5	1502887

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

SDG No: 2015-2137

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 379268004

BASIS: As Received

DATE COLLECTED 11-AUG-15

CLIENT ID: CAMO-15-102614

LEVEL: Low

DATE RECEIVED 13-AUG-15

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	08/17/15 21:33	081715A-1	1500220
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	08/20/15 13:00	150820-4	1500234
7440-38-2	Arsenic	3.45	ug/L	J	1.7	5	5	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7440-39-3	Barium	14.6	ug/L		1	5	5	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-42-8	Boron	34	ug/L	J	15	50	50	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7440-70-2	Calcium	9000	ug/L		50	200	200	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-47-3	Chromium	10	ug/L	U	2	10	10	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7439-89-6	Iron	2560	ug/L		30	100	100	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7439-95-4	Magnesium	3740	ug/L		110	300	300	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7439-96-5	Manganese	170	ug/L		2	10	10	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7439-98-7	Molybdenum	3.46	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/21/15 13:16	150821-2	1500234
7440-02-0	Nickel	1.23	ug/L	J	0.5	2	2	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7440-09-7	Potassium	11500	ug/L		50	150	150	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7631-86-9	Silica	82300	ug/L		53	213	213	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	PRB	08/20/15 13:00	150820-4	1500234
7440-23-5	Sodium	17800	ug/L		100	300	300	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-24-6	Strontium	40.5	ug/L		1	5	5	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	PRB	08/19/15 19:49	150819-3	1500234
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-61-1	Uranium	0.20	ug/L	U	0.067	0.2	0.2	1	MS	PRB	08/20/15 13:00	150820-4	1500234
7440-62-2	Vanadium	3.78	ug/L	J	1	5	5	1	P	HSC	08/17/15 21:33	081715A-1	1500220
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	08/17/15 21:33	081715A-1	1500220

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

**SDG No:** 2015-2137

**CONTRACT:** ESHL00114

**METHOD TYPE:**

**SAMPLE ID:**379268004

**BASIS:** As Received

**DATE COLLECTED** 11-AUG-15

**CLIENT ID:** CAMO-15-102614

**LEVEL:** Low

**DATE RECEIVED** 13-AUG-15

**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	37.9	mg/L		0.453	1.24	1.24	1		JJ2	08/26/15 12:52		1503257

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1500220	1500219	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1500234	1500233	SW846 3005A	50	mL	50	mL	08/13/15	JP1
1502887	1502885	EPA 245.1/245.2 Prep	20	mL	20	mL	08/25/15	AXS5

**\*Analytical Methods:**

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

# **Quality Control Summary**

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

**SDG NO.** 2015-2137  
**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>
1203373768								
	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	178	ug/L	+/-300	J	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203373807								
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203380950								
	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. 2015-2137 Client ID: WST09-15-103883S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 379221001 Spike ID: 1203373771

Analyte	Units	Acceptance Limit	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M*
Manganese	ug/L	75-125	1490		1020		500	94.4		P
Potassium	ug/L	75-125	17500		12500		5000	99.7		P
Silica	ug/L		69100		57000		10700	113	N/A	P
Sodium	ug/L		169000		166000		5000	47.4	N/A	P
Strontium	ug/L	75-125	629		149		500	96		P
Tin	ug/L	75-125	533		8.61	J	500	105		P
Vanadium	ug/L	75-125	525		8.07		500	103		P
Zinc	ug/L		2540		2130		500	82.6	N/A	P
Magnesium	ug/L	75-125	11800		6590		5000	105		P
Aluminum	ug/L	75-125	7950		2390		5000	111		P
Barium	ug/L	75-125	714		203		500	102		P
Beryllium	ug/L	75-125	514		1	U	500	103		P
Boron	ug/L	75-125	635		98.8		500	107		P
Calcium	ug/L		27400		22400		5000	99.4	N/A	P
Cobalt	ug/L	75-125	517		12.9		500	101		P
Copper	ug/L	75-125	1070		547		500	105		P
Iron	ug/L	75-125	18000		12900		5000	103		P

\*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2015-2137 Client ID: WST09-15-103883S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 379221001 Spike ID: 1203373810

<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	45.6		1.51	J	50	88.1		MS
Arsenic	ug/L	75-125	53.9		3.94	J	50	100		MS
Cadmium	ug/L	75-125	46.6		4.44		50	84.4		MS
Chromium	ug/L	75-125	82.5		38.3		50	88.3		MS
Lead	ug/L	75-125	109		61.7		50	94.2		MS
Molybdenum	ug/L	75-125	56.8		9.23		50	95.2		MS
Nickel	ug/L	75-125	91.7		50.4		50	82.6		MS
Selenium	ug/L	75-125	47		1.88	J	50	90.2		MS
Silver	ug/L	75-125	105		64.6		50	80.2		MS
Thallium	ug/L	75-125	34.8		0.528	J	50	68.5	N	MS
Uranium	ug/L	75-125	61.7		12.2		50	99		MS

\*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Spike Summary

SDG NO. 2015-2137 Client ID: WST09-15-103883PS

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 379221001 Spike ID: 1203377940

<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>
Thallium	ug/L	80-120	50.6		0.528	J	50	100		MS

\*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2015-2137 Client ID: CAMO-15-102569S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 379330002 Spike ID: 1203380954

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	1.98		0.067	U	2	99.2		AV

\*Analytical Methods:

AV EPA 245.1/245.2

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

**SDG No.:** 2015-2137

**Lab Code:** GEL

**Contract:** ESHL00114

**Client ID:** WST09-15-103883D

**Matrix:** WATER

**Level:** Low

**Sample ID:** 379221001

**Duplicate ID:** 1203373770

**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-20%	2390		2450		2.7		P
Barium	ug/L	+/-20%	203		208		2.47		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	98.8		100		1.45		P
Calcium	ug/L	+/-20%	22400		22800		1.47		P
Cobalt	ug/L	+/-5	12.9		12.9		.0309		P
Copper	ug/L	+/-20%	547		567		3.57		P
Iron	ug/L	+/-20%	12900		13100		2.03		P
Magnesium	ug/L	+/-20%	6590		6760		2.54		P
Manganese	ug/L	+/-20%	1020		1040		2.01		P
Potassium	ug/L	+/-20%	12500		12800		2		P
Silica	ug/L	+/-20%	57000		58400		2.41		P
Sodium	ug/L	+/-20%	166000		169000		1.37		P
Strontium	ug/L	+/-20%	149		151		1.03		P
Tin	ug/L	+/-10	8.61 J		7.89 J		8.73		P
Vanadium	ug/L	+/-5	8.07		8.22		1.87		P
Zinc	ug/L	+/-20%	2130		2160		1.7		P

\*Analytical Methods:

P SW846 3005A/6010C

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

**SDG No.:** 2015-2137

**Lab Code:** GEL

**Contract:** ESHL00114

**Client ID:** WST09-15-103883D

**Matrix:** WATER

**Level:** Low

**Sample ID:** 379221001

**Duplicate ID:** 1203373809

**Percent Solids for Dup:** N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L	+/-3	1.51 J		1.35 J		10.8		MS
Arsenic	ug/L	+/-5	3.94 J		3.73 J		5.45		MS
Cadmium	ug/L	+/-1	4.44		4.33		2.46		MS
Chromium	ug/L	+/-10	38.3		37.5		2.16		MS
Lead	ug/L	+/-20%	61.7		60.1		2.63		MS
Molybdenum	ug/L	+/-20%	9.23		8.76		5.18		MS
Nickel	ug/L	+/-20%	50.4		48.9		3.13		MS
Selenium	ug/L		1.88 J		1.5 U		200		MS
Silver	ug/L	+/-20%	64.6		61.3		5.22		MS
Thallium	ug/L		0.528 J		0.45 U		200		MS
Uranium	ug/L	+/-20%	12.2		11.8		3.18		MS

**\*Analytical Methods:**

MS SW846 3005A/6020A

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

**SDG No.:** 2015-2137

**Lab Code:** GEL

**Contract:** ESHL00114

**Client ID:** CAMO-15-102569D

**Matrix:** WATER

**Level:** Low

**Sample ID:** 379330002

**Duplicate ID:** 1203380952

**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. 2015-2137

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>
1203373769								
	Aluminum	ug/L	5000	5020		100	80-120	P
	Barium	ug/L	500	514		103	80-120	P
	Beryllium	ug/L	500	517		103	80-120	P
	Boron	ug/L	500	521		104	80-120	P
	Calcium	ug/L	5000	5150		103	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	517		103	80-120	P
	Iron	ug/L	5000	5250		105	80-120	P
	Magnesium	ug/L	5000	5390		108	80-120	P
	Manganese	ug/L	500	507		101	80-120	P
	Potassium	ug/L	5000	5040		101	80-120	P
	Silica	ug/L	10700	10400		97	80-120	P
	Sodium	ug/L	5000	5080		102	80-120	P
	Strontium	ug/L	500	488		97.6	80-120	P
	Tin	ug/L	500	525		105	80-120	P
	Vanadium	ug/L	500	517		103	80-120	P
	Zinc	ug/L	500	496		99.3	80-120	P

\*Analytical Methods:

P SW846 3005A/6010C

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2015-2137

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>
1203373808								
	Antimony	ug/L	50	48		95.9	80-120	MS
	Arsenic	ug/L	50	52.6		105	80-120	MS
	Cadmium	ug/L	50	49.9		99.9	80-120	MS
	Chromium	ug/L	50	48.2		96.4	80-120	MS
	Lead	ug/L	50	54		108	80-120	MS
	Molybdenum	ug/L	50	51.8		104	80-120	MS
	Nickel	ug/L	50	47.4		94.7	80-120	MS
	Selenium	ug/L	50	50.1		100	80-120	MS
	Silver	ug/L	50	50.2		100	80-120	MS
	Thallium	ug/L	50	52		104	80-120	MS
	Uranium	ug/L	50	50.4		101	80-120	MS

\*Analytical Methods:

MS SW846 3005A/6020A

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2015-2137

Contract: ESHL00114

Aqueous LCS Source:GEL

Solid LCS Source:

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<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>
1203380951	Mercury	ug/L	2	1.97		98.7	85-115	AV

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\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2015-2137 Client ID: WST09-15-103883L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 379221001 Serial Dilution ID: 1203373772

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	2390		2280		4.53			P
Barium	203		188		7.15		10	P
Beryllium	1	U	5	U				P
Boron	98.8		100	J	1.65			P
Calcium	22400		21600		3.71		10	P
Cobalt	12.9		12.9	J	.39			P
Copper	547		507		7.31		10	P
Iron	12900		12300		4.8		10	P
Magnesium	6590		6340		3.83		10	P
Manganese	1020		1010		1.44		10	P
Potassium	12500		12100		3.48		10	P
Silica	57000		54400		4.56		10	P
Sodium	166000		154000		7.35		10	P
Strontium	149		141		5.77		10	P
Tin	8.61	J	12.5	U	100			P
Vanadium	8.07		6.71	J	16.8			P
Zinc	2130		2090		1.69		10	P

## \*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2015-2137 Client ID: WST09-15-103883L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 379221001 Serial Dilution ID: 1203373811

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1.51	J	5	U	100			MS
Arsenic	3.94	J	8.5	U	100			MS
Cadmium	4.44		5.05		13.6			MS
Chromium	38.3		39	J	1.83			MS
Lead	61.7		67.3		9.1		10	MS
Molybdenum	9.23		9.42		2.04			MS
Nickel	50.4		52.9		4.89		10	MS
Selenium	1.88	J	7.5	U	100			MS
Silver	64.6		70.4		8.98		10	MS
Thallium	.528	J	2.25	U	100			MS
Uranium	12.2		12.3		.813		10	MS

\*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2015-2137 Client ID: CAMO-15-102569L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 379330002 Serial Dilution ID: 1203380956

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Mercury	.067	U	.335	U				AV

\*Analytical Methods:

AV EPA 245.1/245.2

# Miscellaneous

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 21-AUG-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ICP/MS	<b>Test / Method:</b> SW846 3005A/6020A	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1500234	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 379215(2015-2138),379221(2015-2141),379268(2015-2137)</b>			
<b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203373810MS</p>		<p>1. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity. 1203373810 (WST09-15-103883MS) Thallium [68.5* (75%-125%)].</p>	

**Originator's Name:**  
Paul Boyd 21-AUG-15

**Data Validator/Group Leader:**  
Elizabeth Janssen 21-AUG-15

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2015-2137  
Work Order #: 379268**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1500883

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 9060:

<b>Sample ID</b>	<b>Client ID</b>
379268001	CAMO-15-102574
379268003	CAMO-15-102590
1203375541	Method Blank (MB)
1203375542	Laboratory Control Sample (LCS)
1203375544	379323003(CAMO-15-102583) Sample Duplicate (DUP)
1203375546	379323003(CAMO-15-102583) 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# 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 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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

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

Sample 379323003 (CAMO-15-102583) 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.

#### **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:** 1500327      **Method:** WSP-CN(T)  
**Prep Batch :** 1500325      **Method:** EPA 335.4

### Sample Analysis

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

<b>Sample ID</b>	<b>Client ID</b>
379268001	CAMO-15-102574
379268003	CAMO-15-102590
1203374007	Method Blank (MB)
1203374008	Laboratory Control Sample (LCS)
1203374009	379215001(WSTSIP-15-103065) Sample Duplicate (DUP)
1203374012	379215001(WSTSIP-15-103065) 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# 17.

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

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

### Calibration Information

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

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

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

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 379215001 (WSTSIP-15-103065) was selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference.

Analyte	Sample	Value
Cyanide, Total	1203374012 (WSTSIP-15-103065MS)	63.8* (90%-110%)

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Sample 1203374008 (LCS) was re-analyzed to verify the result.

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

A data exception report (DER) 1440771 was generated for sample 1203374012 (WSTSIP-15-103065MS) 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:** Ion Chromatography  
**Analytical Batch:** 1500349                      **Method:** EPA 300.0 Anions Liquid 28 day

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374081	Method Blank (MB)
1203374082	Laboratory Control Sample (LCS)
1203374083	379215001(WSTSIP-15-103065) Sample Duplicate (DUP)
1203374084	379215001(WSTSIP-15-103065) 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# 24.

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

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

### **Calibration Information**

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

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

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

### **Y Intercept Rule**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The LCS spike recovery met the acceptance limits.

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

Sample 379215001 (WSTSIP-15-103065) 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.

#### **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.

#### **Manual Integrations**

Samples 1203374083 (WSTSIP-15-103065DUP), 1203374084 (WSTSIP-15-103065PS), 379268002 (CAMO-15-102598) and 379268004 (CAMO-15-102614) were manually integrated to correctly position the baseline as set in the calibration standards.

#### **Additional Comments**

Additional comments were not required for this SDG.

#### **Electronic Packaging Comment**

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

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

**Method/Analysis Information**

**Product:** Ammonia Nitrogen  
**Analytical Batch:** 1500587                      **Method:** NH3  
**Prep Batch :** 1500585                      **Method:** EPA 350.1 Prep

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374761	Method Blank (MB)
1203374762	Laboratory Control Sample (LCS)
1203374763	379148002(CASA-15-102650) Sample Duplicate (DUP)
1203374764	379268002(CAMO-15-102598) Sample Duplicate (DUP)
1203374765	379148002(CASA-15-102650) Matrix Spike (MS)
1203374766	379268002(CAMO-15-102598) 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+ 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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Samples 379148002 (CASA-15-102650) and 379268002 (CAMO-15-102598) were selected for QC analysis.

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

The matrix spike recovered outside of the established acceptance limits due to matrix interference.

Analyte	Sample	Value
Nitrogen, Ammonia	1203374765 (CASA-15-102650MS)	118* (90%-110%)

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Sample 379268002 (CAMO-15-102598) was re-analyzed due to (its) proximity to an overrange sample. The results from the reanalysis are reported.

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

A data exception report (DER) 1440840 was generated for sample 1203374765 (CASA-15-102650MS) 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**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1500575	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1500574	<b>Method:</b>	EPA 351.2 Prep

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268001	CAMO-15-102574
379268003	CAMO-15-102590
1203374724	Method Blank (MB)
1203374725	Laboratory Control Sample (LCS)
1203374726	379324001(CAMO-15-102738) Sample Duplicate (DUP)
1203374727	379324001(CAMO-15-102738) 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+ 8500 Series.

**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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 379324001 (CAMO-15-102738) 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.

**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:** Nitrate Nitrite by Cadmium Reduction  
**Analytical Batch:** 1499852 **Method:** NO3NO2

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203372750	Method Blank (MB)
1203372751	Laboratory Control Sample (LCS)
1203372752	379011004(CASA-15-102652) Sample Duplicate (DUP)
1203372754	379011004(CASA-15-102652) 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.

**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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

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

Sample 379011004 (CASA-15-102652) 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.

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

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

### **Technical Information**

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

#### **Holding Times**

All samples in this SDG met the specified holding time.

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

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

#### **Sample Dilutions**

The following samples were diluted because target analyte concentrations exceeded the calibration range. 1203372752 (CASA-15-102652DUP) and 1203372754 (CASA-15-102652PS).

#### **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**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1500565	<b>Method:</b>	EPA 365.4 Phosphorus, Total in
<b>Prep Batch :</b>	1500564	<b>Method:</b>	EPA 365.4 Prep

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374695	Method Blank (MB)
1203374696	Laboratory Control Sample (LCS)
1203374698	379146002(CASA-15-102657) Sample Duplicate (DUP)
1203374700	379146002(CASA-15-102657) 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+ 8500 Series.

**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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 379146002 (CASA-15-102657) 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.

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The following sample was diluted because target analyte concentrations exceeded the calibration range. 379268004 (CAMO-15-102614).

Analyte	379268
	004
Phosphorus, Total as P	5X

**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:** 1500472 **Method:** TDS

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374439	Method Blank (MB)
1203374440	Laboratory Control Sample (LCS)
1203374441	379268002(CAMO-15-102598) 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 (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 379268002 (CAMO-15-102598) 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.

**Sample Aliquot**

A sufficient amount of sample was provided by the client for 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:** 1501375 and 1504613 **Method:** EPA120.1 Specific Conductivity

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203376809	Laboratory Control Sample (LCS)
1203385406	Laboratory Control Sample (LCS)
1203376810	379146002(CASA-15-102657) Sample Duplicate (DUP)
1203376811	379323004(CAMO-15-102607) Sample Duplicate (DUP)
1203385407	379861006(CASA-15-102655) 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# 11.

**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 ManSci PC-Titrate Titrator System.

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

**Initial Standardization**

The titrant was properly standardized

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Designation**

Samples 379146002 (CASA-15-102657), 379323004 (CAMO-15-102607)- Batch 1501375 and 379861006

(CASA-15-102655)- Batch 1504613 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:** 1501372 and 1502200 **Method:** PH

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203376804	Laboratory Control Sample (LCS)
1203378973	Laboratory Control Sample (LCS)
1203376805	379323004(CAMO-15-102607) Sample Duplicate (DUP)
1203376806	379146002(CASA-15-102657) Sample Duplicate (DUP)
1203378974	379268004(CAMO-15-102614) 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# 21.

**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 ManSci PC-Titrate Titrator System.

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

**Initial Standardization**

The titrant was properly standardized

**Quality Control (QC) Information**

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

**Quality Control (QC) Designation**

Samples 379146002 (CASA-15-102657), 379323004 (CAMO-15-102607)- Batch 1501372 and 379268004

(CAMO-15-102614)- Batch 1502200 were selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

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

Sample	Analyte	Value
1203378974 (CAMO-15-102614DUP)		Received 13-AUG-15, out of holding 11-AUG-15
379268002 (CAMO-15-102598)		Received 13-AUG-15, out of holding 11-AUG-15
379268004 (CAMO-15-102614)		Received 13-AUG-15, out of holding 11-AUG-15

**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) 1440141 was generated for sample 379268002 (CAMO-15-102598) in this SDG/batch. A data exception report (DER) 1441419 was generated for samples 379268004 (CAMO-15-102614) and 1203378974 (CAMO-15-102614DUP) 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:** 1500640      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
379268002	CAMO-15-102598
379268004	CAMO-15-102614
1203374900	Method Blank (MB)
1203374902	Laboratory Control Sample (LCS)
1203374904	379146002(CASA-15-102657) Sample Duplicate (DUP)
1203374907	379146002(CASA-15-102657) 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# 11.

### **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 manually operated buret.

### **Initial Standardization**

The titrant was properly standardized

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The LCS spike recovery met the acceptance limits.

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

Sample 379146002 (CASA-15-102657) 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.

**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: 2015-2137 GEL Work Order: 379268

### 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, 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: Thomas Lewis**

**Date: 09 SEP 2015**

**Title: Data Validator**

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: September 9, 2015

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: 2015-2137

Client Sample ID: CAMO-15-102574

Project: ESHL00114

Sample ID: 379268001

Client ID: ARSL004

Matrix: W

Collect Date: 11-AUG-15 12:11

Receive Date: 13-AUG-15

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.390	0.330	1.00	mg/L	1	TSM	08/18/15	0251	1500883	1
<b>Flow Injection Analysis</b>											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	08/20/15	1321	1500327	2
<b>Nutrient Analysis</b>											
TKN "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	08/25/15	1234	1500575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/20/15	1103	1500325
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/24/15	2000	1500574

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 351.2	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 9, 2015

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: 2015-2137

Client Sample ID: CAMO-15-102598  
Sample ID: 379268002  
Matrix: W  
Collect Date: 11-AUG-15 12:11  
Receive Date: 13-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MXL2	08/14/15	0640	1500349	1
Chloride		2.43	0.067	0.200	mg/L	1					
Fluoride		0.265	0.033	0.100	mg/L	1					
Sulfate		3.12	0.133	0.400	mg/L	1					
<b>Nutrient Analysis</b>											
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	J	0.031	0.017	0.050	mg/L	1	KLP1	08/18/15	1440	1500565	2
NH3 "As Received"											
Nitrogen, Ammonia		0.157	0.017	0.050	mg/L	1	KLP1	08/20/15	1243	1500587	3
NO3NO2 "As Received"											
Nitrogen, Nitrate/Nitrite		0.734	0.017	0.050	mg/L	1	AXH3	08/19/15	1148	1499852	4
<b>Solids Analysis</b>											
TDS "As Received"											
Total Dissolved Solids		143	3.40	14.3	mg/L		MXB3	08/14/15	1006	1500472	5
<b>Titration and Ion Analysis</b>											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		60.7	0.725	1.00	mg/L		PXO1	08/18/15	1550	1500640	6
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		130	3.63	14.5	umhos/cm	1	PXO1	08/18/15	1342	1501375	7
PH "As Received"											
pH at Temp 23.6C	H	8.12	0.010	0.100	SU	1	PXO1	08/18/15	1458	1501372	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	08/19/15	1307	1500585
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/17/15	1700	1500564

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Address : TA-03, SM271, Drop Pt. 02U, Rm111

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

Client SDG: 2015-2137

Client Sample ID: CAMO-15-102598  
Sample ID: 379268002

Project: ESHL00114  
Client ID: ARSL004

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 365.4	
3	EPA 350.1	
4	EPA 353.2	
5	EPA 160.1	
6	EPA 310.1	
7	EPA 120.1	
8	EPA 150.1	

**Notes:**

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## Certificate of Analysis

Report Date: September 9, 2015

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: 2015-2137

Client Sample ID: CAMO-15-102590  
Sample ID: 379268003  
Matrix: W  
Collect Date: 11-AUG-15 14:28  
Receive Date: 13-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Carbon Analysis</b>											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.877	0.330	1.00	mg/L	1	TSM	08/18/15	0333	1500883	1
<b>Flow Injection Analysis</b>											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	08/20/15	1322	1500327	2
<b>Nutrient Analysis</b>											
TKN "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	08/25/15	1239	1500575	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	08/20/15	1103	1500325
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	08/24/15	2000	1500574

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 351.2	

**Notes:**

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## Certificate of Analysis

Report Date: September 9, 2015

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: 2015-2137

Client Sample ID: CAMO-15-102614  
Sample ID: 379268004  
Matrix: W  
Collect Date: 11-AUG-15 14:28  
Receive Date: 13-AUG-15  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Ion Chromatography</b>											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MXL2	08/14/15	0713	1500349	1
Chloride		1.84	0.067	0.200	mg/L	1					
Fluoride		0.431	0.033	0.100	mg/L	1					
Sulfate		1.77	0.133	0.400	mg/L	1					
<b>Nutrient Analysis</b>											
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		4.44	0.085	0.250	mg/L	5	KLP1	08/18/15	1454	1500565	2
NH3 "As Received"											
Nitrogen, Ammonia		0.171	0.017	0.050	mg/L	1	KLP1	08/20/15	1225	1500587	3
NO3NO2 "As Received"											
Nitrogen, Nitrate/Nitrite		0.210	0.017	0.050	mg/L	1	AXH3	08/19/15	1149	1499852	4
<b>Solids Analysis</b>											
TDS "As Received"											
Total Dissolved Solids		187	3.40	14.3	mg/L		MXB3	08/14/15	1006	1500472	5
<b>Titration and Ion Analysis</b>											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		75.2	0.725	1.00	mg/L		PXO1	08/18/15	1552	1500640	6
Carbonate alkalinity (CaCO3)	U	ND	0.725	1.00	mg/L						
EPA120.1 Specific Conductivity "As Received"											
Conductivity		173	1.00	1.00	umhos/cm	1	AMB	09/02/15	1544	1504613	7
PH "As Received"											
pH at Temp 13.2C	H	6.58	0.010	0.100	SU	1	AMB	08/22/15	1139	1502200	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	08/19/15	1307	1500585
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	08/17/15	1700	1500564

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 9, 2015

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: 2015-2137

Client Sample ID: CAMO-15-102614  
Sample ID: 379268004

Project: ESHL00114  
Client ID: ARSL004

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 365.4	
3	EPA 350.1	
4	EPA 353.2	
5	EPA 160.1	
6	EPA 310.1	
7	EPA 120.1	
8	EPA 150.1	

**Notes:**

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: September 9, 2015

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 379268

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1500883										
QC1203375544	379323003	DUP									
Total Organic Carbon Average	J	0.864	J	0.869	mg/L	0.577	^	(+/-1.00)	TSM	08/18/15	05:39
QC1203375542	LCS										
Total Organic Carbon Average	10.0			9.92	mg/L			(85%-115%)		08/17/15	21:40
QC1203375541	MB										
Total Organic Carbon Average			U	ND	mg/L					08/17/15	21:26
QC1203375546	379323003	PS									
Total Organic Carbon Average	10.0	J	0.864	10.5	mg/L			(65%-120%)		08/18/15	06:21
<b>Flow Injection Analysis</b>											
Batch	1500327										
QC1203374009	379215001	DUP									
Cyanide, Total	U	ND	J	2.00	ug/L	200			AXH3	08/20/15	12:59
QC1203374008	LCS										
Cyanide, Total	50.0			54.3	ug/L			(90%-110%)		08/20/15	13:06
QC1203374007	MB										
Cyanide, Total			U	ND	ug/L					08/20/15	12:53
QC1203374012	379215001	MS									
Cyanide, Total	100	U	ND	64.6	ug/L			63.8* (90%-110%)		08/20/15	13:00
<b>Ion Chromatography</b>											
Batch	1500349										
QC1203374083	379215001	DUP									
Bromide	U	ND	U	ND	mg/L	N/A			MXL2	08/14/15	04:28
Chloride		6.31		6.17	mg/L	2.27		(0%-20%)			
Fluoride		0.601		0.613	mg/L	1.98		(0%-20%)			
Sulfate		10.4		10.2	mg/L	1.87		(0%-20%)			
QC1203374082	LCS										
Bromide	1.25			1.21	mg/L			97 (90%-110%)		08/14/15	03:23
Chloride	5.00			4.82	mg/L			96.4 (90%-110%)			

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## QC Summary

Workorder: 379268

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1500349										
Fluoride	2.50			2.48	mg/L		99.4	(90%-110%)			
Sulfate	10.0			9.73	mg/L		97.3	(90%-110%)	MXL2	08/14/15	03:23
QC1203374081	MB										
Bromide			U	ND	mg/L					08/14/15	02:50
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203374084	379215001 PS										
Bromide	1.25	U	ND	1.32	mg/L		102	(90%-110%)		08/14/15	05:01
Chloride	5.00		6.31	11.7	mg/L		107	(90%-110%)			
Fluoride	2.50		0.601	3.02	mg/L		96.7	(90%-110%)			
Sulfate	10.0		10.4	21.1	mg/L		107	(90%-110%)			
<b>Nutrient Analysis</b>											
Batch	1499852										
QC1203372752	379011004 DUP										
Nitrogen, Nitrate/Nitrite			2.45	2.40	mg/L	2.07		(0%-20%)	AXH3	08/19/15	11:15
QC1203372751	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.04	mg/L		104	(90%-110%)		08/19/15	11:12
QC1203372750	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					08/19/15	11:11
QC1203372754	379011004 PS										
Nitrogen, Nitrate/Nitrite	1.00		0.489	1.52	mg/L		103	(90%-110%)		08/19/15	11:16
Batch	1500565										
QC1203374698	379146002 DUP										
Phosphorus, Total as P		U	ND	U	ND	mg/L	N/A		KLP1	08/18/15	14:26
QC1203374696	LCS										
Phosphorus, Total as P	1.00			1.09	mg/L		109	(83%-123%)		08/18/15	14:23
QC1203374695	MB										
Phosphorus, Total as P			U	ND	mg/L					08/18/15	14:22

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## QC Summary

Workorder: 379268

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1500565										
QC1203374700	379146002	MS									
Phosphorus, Total as P	1.00	U	ND	1.11	mg/L		110	(59%-141%)	KLP1	08/18/15	14:27
Batch	1500575										
QC1203374726	379324001	DUP									
Nitrogen, Total Kjeldahl			0.179	0.177	mg/L	1.12	^	(+/-0.100)	KLP1	08/25/15	12:46
QC1203374725	LCS										
Nitrogen, Total Kjeldahl	1.00			1.04	mg/L		104	(90%-110%)		08/25/15	12:27
QC1203374724	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					08/25/15	12:26
QC1203374727	379324001	MS									
Nitrogen, Total Kjeldahl	1.00		0.179	1.13	mg/L		95.1	(90%-110%)		08/25/15	12:47
Batch	1500587										
QC1203374763	379148002	DUP									
Nitrogen, Ammonia			0.083	0.075	mg/L	10.1	^	(+/-0.050)	KLP1	08/20/15	12:19
QC1203374764	379268002	DUP									
Nitrogen, Ammonia			0.157	0.129	mg/L	19.6	^	(+/-0.050)		08/20/15	12:24
QC1203374762	LCS										
Nitrogen, Ammonia	1.00			0.971	mg/L		97.1	(90%-110%)		08/20/15	12:14
QC1203374761	MB										
Nitrogen, Ammonia			U	ND	mg/L					08/20/15	12:13
QC1203374765	379148002	MS									
Nitrogen, Ammonia	1.00		0.083	1.26	mg/L		118*	(90%-110%)		08/20/15	12:20
QC1203374766	379268002	MS									
Nitrogen, Ammonia	1.00		0.157	1.24	mg/L		108	(90%-110%)		08/20/15	12:25
<b>Solids Analysis</b>											
Batch	1500472										
QC1203374441	379268002	DUP									
Total Dissolved Solids			143	140	mg/L	2.02		(0%-5%)	MXB3	08/14/15	10:06
QC1203374440	LCS										
Total Dissolved Solids	300			300	mg/L		100	(95%-105%)		08/14/15	10:06
QC1203374439	MB										
Total Dissolved Solids			U	ND	mg/L					08/14/15	10:06
<b>Titration and Ion Analysis</b>											

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## QC Summary

Workorder: 379268

Page 4 of 5

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1500640										
QC1203374904	379146002	DUP									
Alkalinity, Total as CaCO3			83.6	82.6	mg/L	1.2		(0%-20%)	PXO1	08/18/15	15:15
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203374902	LCS										
Alkalinity, Total as CaCO3	50.0			50.8	mg/L		102	(90%-110%)		08/18/15	14:51
QC1203374900	MB										
Alkalinity, Total as CaCO3			U	ND	mg/L					08/18/15	14:51
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1203374907	379146002	MS									
Alkalinity, Total as CaCO3	50.0		83.6	133	mg/L		98.6	(80%-120%)		08/18/15	15:17
Batch	1501372										
QC1203376805	379323004	DUP									
pH	H	7.83	H	7.87	SU	0.481		(0%-5%)	PXO1	08/18/15	15:24
QC1203376806	379146002	DUP									
pH	H	7.88	H	7.88	SU	0.0795		(0%-5%)		08/18/15	14:11
QC1203376804	LCS										
pH	7.00			7.02	SU		100	(99%-101%)		08/18/15	13:56
Batch	1501375										
QC1203376810	379146002	DUP									
Conductivity			565	568	umhos/cm	0.526		(0%-10%)	PXO1	08/18/15	13:29
QC1203376811	379323004	DUP									
Conductivity			486	488	umhos/cm	0.409		(0%-10%)		08/18/15	13:45
QC1203376809	LCS										
Conductivity	1410			1390	umhos/cm		98.3	(95%-105%)		08/18/15	13:27
Batch	1502200										
QC1203378974	379268004	DUP									
pH	H	6.58	H	6.65	SU	1.06		(0%-5%)	AMB	08/22/15	11:40
QC1203378973	LCS										
pH	7.00			6.95	SU		99.3	(99%-101%)		08/22/15	11:36
Batch	1504613										
QC1203385407	379861006	DUP									
Conductivity			443	443	umhos/cm	0		(0%-10%)	AMB	09/02/15	16:05

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## QC Summary

Workorder: 379268

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Titration and Ion Analysis</b>											
Batch	1504613										
QC1203385406	LCS										
Conductivity	1410			1420	umhos/cm		101	(95%-105%)	AMB	09/02/15	15:44

### Notes:

- < Result is less than value reported
- > Result is greater than value reported
- B The target analyte was detected in the associated blank.
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- N/A RPD or %Recovery limits do not apply.
- NI 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, 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**

<b>Mo.Day Yr.</b> 19-AUG-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> PC-Titrate TitraSip System	<b>Test / Method:</b> EPA 150.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> BETT, ESHL
<b>Batch ID:</b> 1501372	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 379142(2015-2128),379146(2015-2126),379148(2015-2125),379162,379215(2015-2138),379221(2015-2141),379268(2015-2137),379322(2015-2150),379323(2015-2151),379325(2015-2156),379326(2015-2157),379330(2015-2152)</p> <p><b>Application Issues:</b></p> <p>Sample received out of holding</p>			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Sample received out of holding:</p> <p>379142 008</p> <p>379146 002,004</p> <p>379148 002</p> <p>379162 002,006,010</p> <p>379215 001,005</p> <p>379221 001</p> <p>379268 002</p> <p>379322 007,009</p> <p>379323 002,004</p> <p>379325 002</p> <p>379326 002</p> <p>379330 006</p>		<p>1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.</p> <p>379142008 (WTLAP-15-103775) [See applicable report].</p> <p>379146002 (CASA-15-102657) [See applicable report].</p> <p>379146004 (CASA-15-102622) [See applicable report].</p> <p>379148002 (CASA-15-102650) [See applicable report].</p> <p>379162002 (15-LE06-0436) [See applicable report].</p> <p>379162006 (15-LE06-0440) [See applicable report].</p> <p>379162010 (15-LE06-0444) [See applicable report].</p> <p>379215001 (WSTSIP-15-103065) [See applicable report].</p> <p>379215005 (WSTSIP-15-103064) [See applicable report].</p> <p>379221001 (WST09-15-103883) [See applicable report].</p> <p>379268002 (CAMO-15-102598) [See applicable report].</p> <p>379322007 (WTLAP-15-103896) [See applicable report].</p> <p>379322009 (WTLAP-15-103916) [See applicable report].</p> <p>379323002 (CAMO-15-102603) [See applicable report].</p> <p>379323004 (CAMO-15-102607) [See applicable report].</p> <p>379325002 (CAMO-15-102599) [See applicable report].</p> <p>379326002 (CAMO-15-102615) [See applicable report].</p> <p>379330006 (CAMO-15-102593) [See applicable report].</p>	

**Originator's Name:**

Patrick Orgel 19-AUG-15

**Data Validator/Group Leader:**

Thomas Lewis 21-AUG-15

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 20-AUG-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 335.4, EPA 335.4 SC, SM 4500-Cn E, SW846 9012B	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, FBWP, GWSD, TVAU,
<b>Batch ID:</b> 1500327	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 379215(2015-2138),379267,379268(2015-2137),379323(2015-2151),379330(2015-2152)</b>			
<b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203374012MS,1203374013MS, 1203374014MS</p>		<p>1. The matrix spike recovered outside of the established acceptance limits due to matrix interference. Cyanide, Total 1203374012 (WSTSIP-15-103065MS) [63.8* (90%-110%)], 1203374013 (D3D1W032-06-01MS) [115* (90%-110%)] and 1203374014 (EMWGW6751MS) [116* (90%-110%)].</p>	

**Originator's Name:**

Aubrey Kingsbury 20-AUG-15

**Data Validator/Group Leader:**

Kristen Mizzell 20-AUG-15

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 20-AUG-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> LACHAT Flow Injection Analyzer	<b>Test / Method:</b> EPA 350.1, EPA 350.1 SC	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1500587	<b>Sample Numbers:</b> See Below		
<p><b>Potentially affected work order(s)(SDG):</b> 379148(2015-2125),379197,379248,379268(2015-2137),379323(2015-2151),379324(2015-2153),379325(2015-2156),379326(2015-2157),379330(2015-2152),379340,379350</p> <p><b>Application Issues:</b></p> <p>Failed Recovery for MS/MSD, or PS/PSD</p>			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
<p>1. Failed Recovery for MS/MSD, or PS/PSD:</p> <p>QC 1203374765MS</p>		<p>1. The matrix spike recovered outside of the established acceptance limits due to matrix interference. Nitrogen, Ammonia 1203374765 (CASA-15-102650MS) [118* (90%-110%)].</p>	

**Originator's Name:**

Kristen Mizzell 20-AUG-15

**Data Validator/Group Leader:**

Aubrey Kingsbury 20-AUG-15

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 22-AUG-15	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040B/9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, SNLS
<b>Batch ID:</b> 1502200	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 379268(2015-2137),379485(2015-2164),379486(2015-2165),379601</b>			
<b>Application Issues:</b> Sample received out of holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Sample received out of holding:</p> <p>379268 004</p> <p>379485 001</p> <p>379486 001,010</p> <p>379601 004</p> <p>QC 1203378974DUP,1203378975DUP</p>		<p>1. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified.</p> <p>1203378974 (CAMO-15-102614DUP) [Received 13-AUG-15, out of holding 11-AUG-15].</p> <p>1203378975 (098251-004DUP) [Received 19-AUG-15, out of holding 18-AUG-15].</p> <p>379268004 (CAMO-15-102614) [Received 13-AUG-15, out of holding 11-AUG-15].</p> <p>379485001 (WST22-15-103884) [Received 18-AUG-15, out of holding 13-AUG-15].</p> <p>379486001 (WT_REF-15-102392) [Received 18-AUG-15, out of holding 08-AUG-15].</p> <p>379486010 (WT_REF-15-102394) [Received 18-AUG-15, out of holding 08-AUG-15].</p> <p>379601004 (098251-004) [Received 19-AUG-15, out of holding 18-AUG-15].</p>	

**Originator's Name:**

Alyson Boltz 22-AUG-15

**Data Validator/Group Leader:**

Elzbieta Szulc 25-AUG-15