

The order of this data package is as follows:

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

Comments:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148063

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11/20/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1101		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-45 S1		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-CR52/53	1 LITER POLY	1	ICE		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-N15/O18- NO3	40 mL Glass	2	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	Y	

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

11/20/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148063**WORK ORDER:****COLLECTED BY (PRINT):** T. Bonham

RELINQUISHED BY (Printed Name) <i>Tanner Bonham</i> (Signature) <i>[Signature]</i>	Date/Time 11/20/2017 1410	RECEIVED BY (Printed Name) <i>Sherwood</i> (Signature) <i>[Signature]</i>	Date/Time 11/20/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148077

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1050		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Sampled with running diesel generator ~40ft. away.

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1050	HH:MM	Discharge Rate	3.26 gpm	Dissolved Oxygen	7.09 mg/L
Groundwater Elevation			Oxidation-Reduction Potential	236.2 mV	Period Purge Volume	NA
pH	7.74		Purge Volume	166.26 gal.	Specific Conductance	134.3 μ S/cm
Temperature	20.1 °C		Total Volume Pumped	241.24 gal	Turbidity	0.18 NTU

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148077

WORK ORDER:

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

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 11-20-17 1330	RECEIVED BY <i>Sherwood</i> (Printed Name) (Signature) <i>Sherwood</i>	Date/Time 11/20/17 13:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148100

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1050		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-44 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 2 11/20/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

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

RELINQUISHED BY (Printed Name) Tanya Vander Vliet (Signature) <i>Tanya Vander Vliet</i>	Date/Time 11-20-17 1330	RECEIVED BY <i>S. Sherwood</i> (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 11/20/17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148112

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1050		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-44 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Tanya VanderVir (Signature) <i>Tanya VanderVir</i>	Date/Time 11-20-17 1330	RECEIVED BY (Printed Name) <i>Sherwood</i> (Signature) <i>Sherwood</i>	Date/Time 11/20/17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/30/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148061

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1050		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S1		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-CR52/53	1 LITER POLY	1	ICE		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-N15/O18- NO3	40 mL Glass	2	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

TV 11-20-17

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148061**WORK ORDER:****COLLECTED BY (PRINT):** M. Shendo, K. Tow

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 11-20-17 1330	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>S. Sherwood</i>	Date/Time 11/20/17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148101

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1239		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-44 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 11/20/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

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

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	Date/Time 11-20-18 1330	RECEIVED BY (Printed Name) S. Sherwood (Signature) S. Sherwood	Date/Time 11/20/17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148062

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1239		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S2		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-CR52/53	1 LITER POLY	1	ICE		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-N15/O18- NO3	40 mL Glass	2	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

TV 11-20-17

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148078

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11-20-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1239		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-44 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	500 ML POLY	1	HNO3	Y	NA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Sampled with running diesel generator 45ft. away.

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1239	HH:MM	Discharge Rate	3.30 gpm	Dissolved Oxygen	6.90 mg/L
Groundwater Elevation			Oxidation-Reduction Potential	250.5 mV	Period Purge Volume	NA
pH	7.84		Purge Volume	231.00 gal.	Specific Conductance	139.9 μ S/cm
Temperature	20.3 °C		Total Volume Pumped	303.60 gal	Turbidity	0.21 NTU

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148078**WORK ORDER:**

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

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 11-20-17 1330	RECEIVED BY <i>S. Sherwood</i> (Printed Name) <i>S. Sherwood</i> (Signature) <i>S. Sherwood</i>	Date/Time 11/20/17 13:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148062**WORK ORDER:****COLLECTED BY (PRINT):** M. Shendo, K. Tow

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 11-20-17 1330	RECEIVED BY <i>S. Sherwood</i> (Printed Name) <i>S. Sherwood</i> (Signature) <i>S. Sherwood</i>	Date/Time 11/20/17 1330
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148079

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	<u>11/20/2017</u>	<u>OK</u>	FIELD MATRIX:	<u>WG</u>	<u>OK</u>
TIME COLLECTED (HH:MM):	<u>1101</u>		MEDIA:	<u>OK</u>	
PRS ID:	<u>OK</u>		SAMPLE TECH CODE:	<u>GSP</u>	
LOCATION ID:	<u>R-45 S1</u>		FIELD PREP:	<u>UF</u>	
LOCATION TYPE:	<u>OK</u>		FIELD QC TYPE:	<u>REG</u>	
TOP DEPTH:	<u>↓</u>		SAMPLE USAGE:	<u>INV</u>	<u>↓</u>
BOTTOM DEPTH:	<u>↓</u>	<u>↓</u>	EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
<u>NA</u>	MSGP-Hg	500 ML POLY	1	HNO3	<u>Y</u>	<u>NA</u>
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	<u>↓</u>	<u>↓</u>

SAMPLE COMMENTS: sampled soil from running diesel generatorLOCATION COMMENTS: NA

FIELD PARAMETERS:

Sample Time	<u>1101</u>	HH:MM	Discharge Rate	<u>3.53</u>	Dissolved Oxygen	<u>6.95</u>
Groundwater Elevation	<u>5932.07</u>		Oxidation-Reduction Potential	<u>241.3</u>	Period Purge Volume	<u>NA</u>
pH	<u>7.78</u>		Purge Volume	<u>155.32</u>	Specific Conductance	<u>188.0</u>
Temperature	<u>19.6</u>		Total Volume Pumped	<u>232.96</u>	Turbidity	<u>0.28</u>

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148079**WORK ORDER:****COLLECTED BY (PRINT):** T. Bonham

RELINQUISHED BY (Printed Name) <i>Temper Bonham</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/2017</i> <i>1410</i>	RECEIVED BY <i>S. Sherwood</i> (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/17</i> <i>1410</i>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148102

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11/20/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1101		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	De	
LOCATION ID:	R-45 S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

COLLECTED BY (PRINT): T. Benham

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 11/20/2017 1410	RECEIVED BY (Printed Name) (Signature)	Date/Time 11/20/17 1410
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148080

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	11/20/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1303		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-45 S2		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	MSGP-Hg	500 ML POLY	1	HNO3	Y	MA
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS: Sampled 50 ft. from running diesel generator

LOCATION COMMENTS: MA

FIELD PARAMETERS:

Sample Time	1303	HH:MM	Discharge Rate	3.6	Dissolved Oxygen	6.59
Groundwater Elevation	5831.00		Oxidation-Reduction Potential	208.8	Period Purge Volume	NA
pH	7.99		Purge Volume	277.97	Specific Conductance	174.2
Temperature	21.0		Total Volume Pumped	353.78	Turbidity	0.09

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148080**WORK ORDER:****COLLECTED BY (PRINT):** T. Bonham

RELINQUISHED BY (Printed Name) <i>Tanner Bonham</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/2017</i> <i>1410</i>	RECEIVED BY (Printed Name) <i>Lance Onstott</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/17</i> <i>1410</i>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11552

EVENT NAME: Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1

SAMPLE ID: CAMO-18-148064

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	11/20/2017	OK	FIELD MATRIX:	W	OK
TIME COLLECTED (HH:MM):	1303		MEDIA:	OK	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-45 S2		FIELD PREP:	F	
LOCATION TYPE:	OK		FIELD QC TYPE:	TEST	
TOP DEPTH:			SAMPLE USAGE:	TEST	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	Y	NA
	WSP-CR52/53	1 LITER POLY	1	ICE		
	WSP- GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-N15/O18- NO3	40 mL Glass	2	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time	_____	HH:MM	Discharge Rate	_____	Dissolved Oxygen	_____
Groundwater Elevation	_____		Oxidation-Reduction Potential	_____	Period Purge Volume	_____
pH	_____		Purge Volume	_____	Specific Conductance	_____
Temperature	_____		Total Volume Pumped	_____	Turbidity	_____

11/20/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11552**EVENT NAME:** Mortandad/Sandia (Cr Inv and MDA C)
MY2018 Q1**SAMPLE ID:** CAMO-18-148064**WORK ORDER:****COLLECTED BY (PRINT):** T. Bonhorn

RELINQUISHED BY (Printed Name) <i>Tanner Bonhorn</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/17</i> <i>1410</i>	RECEIVED BY (Printed Name) <i>Ranee Orstoft</i> (Signature) <i>[Signature]</i>	Date/Time <i>11/20/17</i> <i>1410</i>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

TEST - Explosives		YES	NO
Samples collected from a WFO area? (TAs -08, 09, 11, 14, 15, 16, 22, 36, 37, 39, 40, and 49)			X
Field Test for Explosives Results		YES	NO
HE SPOT test result positive. If YES - Do not transport.			X

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		X	
Field Team Member Statement		YES	NO
Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.			X

TEST - Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				X
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	AND Alpha ≥ 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		X
Alpha ≥ 125	AND Alpha ≥ 1,250,000	AT other locations		X
Beta ≥ 1,500	AND Beta ≥ 15,000,000	AT any location		X
The sample Alpha ≥ 16,000,000 dpm*g/100cm ² or Beta ≥ 160,000,000 dpm*g/100cm ² . If YES - Do not ship.				X
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.				X
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity.				X

TEST - Location		YES	NO
Prior analytical measurements of radioactive isotopes are available?		X	
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO
• Am-241 ≥ 27 pCi/g	AND Am-241 ≥ 270,000 pCi Total		
• Cs-137 ≥ 270 pCi/g	AND Cs-137 ≥ 270,000 pCi Total		
• Pu-238 ≥ 27 pCi/g	AND Pu-238 ≥ 270,000 pCi Total		
• Pu-239/240 ≥ 27 pCi/g	AND Pu-239/240 ≥ 270,000 pCi Total		X
• Th-228 ≥ 27 pCi/g	AND Th-228 ≥ 270,000 pCi Total		
• U-234 ≥ 270 pCi/g	AND U-234 ≥ 1,600,000,000 pCi Total		
• U-238 ≥ 270 pCi/g	AND U-238 ≥ unlimited		
• H-3 ≥ 27,000,000 pCi/g	AND H-3 ≥ 27,000,000,000 pCi Total		
Am-241, Pu-238, Pu-239/240, or Th-228 ≥ 27,000,000 pCi; or Cs-137 ≥ 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.			X
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.			X

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) Tanya Vander-Vis	11-20-17
(Signature) Tanya Vander-Vis	1330

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) Ranae Onstott	11/20/17
(Signature) Ranae Onstott	1330

TEST - Explosives		YES	NO
Samples collected from a WFO area? (TAs -08, 09, 11, 14, 15, 16, 22, 36, 37, 39, 40, and 49)			X
Field Test for Explosives Results		YES	NO
HE SPOT test result positive. If YES - Do not transport.			X

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		X	
Field Team Member Statement		YES	NO
Chemical preservation exceeds limits given 40 CFR 136, Table II - Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.			X

TEST - Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				X
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	AND Alpha ≥ 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		X
Alpha ≥ 125	AND Alpha ≥ 1,250,000	AT other locations		X
Beta ≥ 1,500	AND Beta ≥ 15,000,000	AT any location		X
The sample Alpha ≥ 16,000,000 dpm*g/100cm ² or Beta ≥ 160,000,000 dpm*g/100cm ² . If YES - Do not ship.				X
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES - Do not ship.				X
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on field screening measurements of alpha and beta activity.				X

TEST - Location			YES	NO
Prior analytical measurements of radioactive isotopes are available?			X	
Sample Activity (pCi/g)	Shipment Activity (pCi)		YES	NO
• Am-241 ≥ 27 pCi/g	AND	Am-241 ≥ 270,000 pCi Total		
• Cs-137 ≥ 270 pCi/g	AND	Cs-137 ≥ 270,000 pCi Total		
• Pu-238 ≥ 27 pCi/g	AND	Pu-238 ≥ 270,000 pCi Total		
• Pu-239/240 ≥ 27 pCi/g	AND	Pu-239/240 ≥ 270,000 pCi Total		X
• Th-228 ≥ 27 pCi/g	AND	Th-228 ≥ 270,000 pCi Total		X
• U-234 ≥ 270 pCi/g	AND	U-234 ≥ 1,600,000,000 pCi Total		
• U-238 ≥ 270 pCi/g	AND	U-238 ≥ unlimited		
• H-3 ≥ 27,000,000 pCi/g	AND	H-3 ≥ 27,000,000,000 pCi Total		
Am-241, Pu-238, Pu-239/240, or Th-228 ≥ 27,000,000 pCi; or Cs-137 ≥ 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES - Do not ship.				X
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910, based on prior analytical measurements of radioactive isotopes.				X

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

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Tanya Vander-Vis</u>	<u>11-20-17</u>
(Signature) <u>Tanya Vander-Vis</u>	<u>1330</u>

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>Ranee Onstott</u>	<u>11/20/17</u>
(Signature) <u>Ranee Onstott</u>	<u>1330</u>

TEST – Explosives		YES	NO
Samples collected from a WFO area? (TAs -08, 09, 11, 14, 15, 16, 22, 36, 37, 39, 40, and 49)			<input checked="" type="checkbox"/>
Field Test for Explosives Results		YES	NO
HE SPOT test result positive. If YES - Do not transport.			<input checked="" type="checkbox"/>

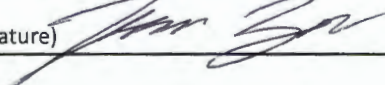
TEST – Chemical Preservation		YES	NO
Samples are chemically preserved?		<input checked="" type="checkbox"/>	
Field Team Member Statement		YES	NO
Chemical preservation exceeds limits given 40 CFR 136, Table II – Required Containers, Preservation Techniques and Holding Times (footnote 3). If YES - Do not ship.			<input checked="" type="checkbox"/>


TEST – Field Screen			YES	NO
The sample has field screening measurements of alpha activity and beta activity?				<input checked="" type="checkbox"/>
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	AND Alpha ≥ 160,000	AT TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		<input checked="" type="checkbox"/>
Alpha ≥ 125	AND Alpha ≥ 1,250,000	AT other locations		
Beta ≥ 1,500	AND Beta ≥ 15,000,000	AT any location		
The sample Alpha ≥ 16,000,000 dpm*g/100cm ² or Beta ≥ 160,000,000 dpm*g/100cm ² . If YES – Do not ship.				
On the external surface of the sample container, alpha activity ≥ 24 dpm/cm ² , beta activity ≥ 240 dpm/cm ² , or surface activity ≥ 0.5 mR/hr. If YES – Do not ship.				
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on field screening measurements of alpha and beta activity.				

TEST - Location			YES	NO
Prior analytical measurements of radioactive isotopes are available?			<input checked="" type="checkbox"/>	
Sample Activity (pCi/g)	Shipment Activity (pCi)		YES	NO
• Am-241 ≥ 27 pCi/g	AND	Am-241 ≥ 270,000 pCi Total		<input checked="" type="checkbox"/>
• Cs-137 ≥ 270 pCi/g	AND	Cs-137 ≥ 270,000 pCi Total		
• Pu-238 ≥ 27 pCi/g	AND	Pu-238 ≥ 270,000 pCi Total		
• Pu-239/240 ≥ 27 pCi/g	AND	Pu-239/240 ≥ 270,000 pCi Total		
• Th-228 ≥ 27 pCi/g	AND	Th-228 ≥ 270,000 pCi Total		
• U-234 ≥ 270 pCi/g	AND	U-234 ≥ 1,600,000,000 pCi Total		
• U-238 ≥ 270 pCi/g	AND	U-238 ≥ unlimited		
• H-3 ≥ 27,000,000 pCi/g	AND	H-3 ≥ 27,000,000,000 pCi Total		
Am-241, Pu-238, Pu-239/240, or Th-228 ≥ 27,000,000 pCi; or Cs-137 ≥ 270,000,000 pCi or U-234 ≥ 160,000,000 pCi; or H-3 ≥ 1 Ci. If YES – Do not ship.				
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, based on prior analytical measurements of radioactive isotopes.				

TEST – AK		YES	NO
The shippers documented knowledge of the sample positively identifies appropriate labeling.			<input checked="" type="checkbox"/>
Documented Field Team Member Statement		YES	NO
The sample is tentatively identified as DOT Hazard Class 7 (Radioactive). The shipment is labeled Radioactive Material, Excepted Package – Limited Quantity of Material – UN2910, and the sample is submitted to ARS or RP for hazard classification analysis.			<input checked="" type="checkbox"/>

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

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Tanner Bonham</u>	<u>11/20/2017</u>
(Signature) 	<u>1420</u>

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <u>Ranee Orskott</u>	<u>11/20/17</u>
(Signature) 	<u>1420</u>

DATA VALIDATION REPORT

Chain Of Custody No. 2018-1038

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
438505	EPA:120.1	3				
438505	EPA:150.1	3				
438505	EPA:160.1	3				
438505	EPA:170.0	6		3	1	
438505	EPA:245.2	6				
438505	EPA:300.0	3				
438505	EPA:310.1	3				
438505	EPA:335.4	3				
438505	EPA:350.1	3				
438505	EPA:351.2	3				
438505	EPA:353.2	3				
438505	EPA:365.4	3				
438505	EPA:900	3				
438505	EPA:901.1	3				
438505	EPA:905.0	3				
438505	HASL-300:AM-241	3				
438505	HASL-300:ISOPU	3				
438505	HASL-300:ISOU	3				
438505	SM:A2340B	3				
438505	SW-846:6010C	3				
438505	SW-846:6020	3				
438505	SW-846:6850	3				
438505	SW-846:8260B	3		3	1	
438505	SW-846:8270D	3			1	
438505	SW-846:9060	3				

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
438505	EPA:120.1	1721672	1721672	2										1			1				
438505	EPA:120.1	1722724	1722724	1										1			1				
438505	EPA:150.1	1721541	1721541	2										1			2				
438505	EPA:150.1	1722709	1722709	1										1			1				
438505	EPA:160.1	1721642	1721642	2					1					1			1				
438505	EPA:160.1	1722593	1722593	1					1					1			1				
438505	EPA:170.0	NA	NA	6		3	1														
438505	EPA:245.2	1724840	1724839	6					1	1				1			1				
438505	EPA:300.0	1721837	1721837	2					1					1			1				
438505	EPA:300.0	1724765	1724765	1					1					1			1				
438505	EPA:310.1	1721540	1721540	2						1				1			1				
438505	EPA:310.1	1722708	1722708	1						1				1			1				
438505	EPA:335.4	1721219	1721218	3					1	1				1			1				
438505	EPA:350.1	1721371	1721370	2					1	1				1			1				
438505	EPA:350.1	1722580	1722577	1					1	1				1			1				
438505	EPA:351.2	1721225	1721224	3					1	1				1			1				
438505	EPA:353.2	1721373	1721373	2					1					1			1				
438505	EPA:353.2	1722581	1722581	1					1					1			1				
438505	EPA:365.4	1721223	1721222	2					1	1				1			1				
438505	EPA:365.4	1722574	1722573	1					1	1				1			1				
438505	EPA:900	1722977	1722977	3					1	1	1			1			1				
438505	EPA:901.1	1721601	1721601	3					1					1			1				
438505	EPA:905.0	1723383	1723383	3					1	1				1			1				
438505	HASL-300:AM-241	1722107	1722107	3					1					1			1				
438505	HASL-300:ISOPU	1722108	1722108	3					1					1			1				
438505	HASL-300:ISOU	1722109	1722109	3					1					1			1				
438505	SM:A2340B	1726878	1726878	3																	
438505	SW-846:6010C	1721414	1721413	2					1	1				1			1				
438505	SW-846:6010C	1722493	1722492	1					1	1				1			1				
438505	SW-846:6020	1721388	1721387	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
438505	SW-846:6020	1722497	1722496	1					1	1				1			1				
438505	SW-846:6850	1723621	1723619	3					1	1	1			1							
438505	SW-846:8260B	1722112	1722112	3		3	1		2					4							
438505	SW-846:8270D	1721502	1721501	3			1		1	1	1			1							
438505	SW-846:9060	1720555	1720555	3					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-18-148061	1203926819	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-148063	1203929389	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203926818	LCS	0	0	1	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203929388	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-147990	1203926490	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-148064	1203926491	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-18-148734	1203929354	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203926489	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203929353	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148063	1203929078	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148064	1203926729	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203926725	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:160.1	GENERAL CHEMISTRY	LCS	1203929077	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203926724	MB	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203929076	MB	1	0	0	0
EPA:170.0	VOC	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:170.0	VOC	CAMO-18-148077	438505002	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148078	438505006	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148079	438505008	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-148080	438505011	TEST	1	0	0	0
EPA:170.0	VOC	CAMO-18-148100	438505003	FTB	1	0	0	0
EPA:170.0	VOC	CAMO-18-148101	438505007	FTB	1	0	0	0
EPA:170.0	VOC	CAMO-18-148102	438505009	FTB	1	0	0	0
EPA:170.0	VOC	CAMO-18-148112	438505004	FB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148061	1203934943	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148061	1203934944	MS	0	0	1	0
EPA:245.2	INORGANIC	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148077	438505002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148078	438505006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148079	438505008	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-148080	438505011	TEST	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203934942	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203934941	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-148067	1203927311	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CASA-18-148737	1203934723	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203927310	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203934722	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203927309	MB	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203934721	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147990	1203926485	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147990	1203926488	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	2	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:310.1	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-18-148734	1203929348	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-18-148734	1203929352	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203926482	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203929343	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-148077	1203926149	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-148077	1203926151	MS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-148077	438505002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-148078	438505006	REG	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-148079	438505008	REG	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-148080	438505011	TEST	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203925716	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203925715	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148061	1203926139	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148061	1203926142	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148063	1203929025	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148063	1203929026	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203926136	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203929024	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203926135	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203929023	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148077	438505002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148078	438505006	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148079	438505008	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148080	438505011	TEST	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148083	1203925739	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-148083	1203925741	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203925738	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203925737	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CTUA-17-142758	1203926155	DUP	1	0	0	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:353.2	GENERAL CHEMISTRY	LCS	1203926154	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203929040	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203926153	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203929039	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	WST03-18-149992	1203929041	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148061	438505001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148062	438505005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148063	438505012	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148064	438505010	TEST	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148067	1203925729	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-148067	1203925731	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203925728	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203929008	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203925727	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203929007	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST03-18-149992	1203929009	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	WST03-18-149992	1203929010	MS	0	0	1	0
EPA:900	RAD	CAMO-18-148077	438505002	REG	2	0	0	0
EPA:900	RAD	CAMO-18-148078	1203930062	DUP	2	0	0	0
EPA:900	RAD	CAMO-18-148078	1203930063	MS	0	0	2	0
EPA:900	RAD	CAMO-18-148078	1203930064	MSD	0	0	2	0
EPA:900	RAD	CAMO-18-148078	438505006	REG	2	0	0	0
EPA:900	RAD	CAMO-18-148079	438505008	REG	2	0	0	0
EPA:900	RAD	CAMO-18-148080	438505011	TEST	2	0	0	0
EPA:900	RAD	LCS	1203930065	LCS	0	0	2	0
EPA:900	RAD	MB	1203930061	MB	2	0	0	0
EPA:901.1	RAD	CAMO-18-148077	1203926609	DUP	5	0	0	0
EPA:901.1	RAD	CAMO-18-148077	438505002	REG	5	0	0	0
EPA:901.1	RAD	CAMO-18-148078	438505006	REG	5	0	0	0
EPA:901.1	RAD	CAMO-18-148079	438505008	REG	5	0	0	0
EPA:901.1	RAD	CAMO-18-148080	438505011	TEST	5	0	0	0
EPA:901.1	RAD	LCS	1203926610	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203926608	MB	5	0	0	0
EPA:905.0	RAD	CAMO-18-148077	438505002	REG	1	0	0	0
EPA:905.0	RAD	CAMO-18-148078	438505006	REG	1	0	0	0
EPA:905.0	RAD	CAMO-18-148079	438505008	REG	1	0	0	0
EPA:905.0	RAD	CAMO-18-148080	1203931118	DUP	1	0	0	0
EPA:905.0	RAD	CAMO-18-148080	1203931119	MS	0	0	1	0
EPA:905.0	RAD	CAMO-18-148080	438505011	TEST	1	0	0	0
EPA:905.0	RAD	LCS	1203931120	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:905.0	RAD	MB	1203931117	MB	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148077	1203927925	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148077	438505002	REG	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148078	438505006	REG	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148079	438505008	REG	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-148080	438505011	TEST	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203927926	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203927924	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148077	1203927928	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148077	438505002	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148078	438505006	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148079	438505008	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-148080	438505011	TEST	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203927929	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203927927	MB	2	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148077	1203927931	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148077	438505002	REG	3	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148078	438505006	REG	3	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148079	438505008	REG	3	0	0	0
HASL-300:ISOU	RAD	CAMO-18-148080	438505011	TEST	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203927932	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203927930	MB	3	0	0	0
SM:A2340B	INORGANIC	CAMO-18-148061	438505001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-18-148062	438505005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-18-148063	438505012	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-18-148064	438505010	TEST	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148061	1203926281	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148061	1203926282	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-18-148061	438505001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148062	438505005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148063	1203928815	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148063	1203928816	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAMO-18-148063	438505012	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-148064	438505010	TEST	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203926280	LCS	0	0	17	0
SW-846:6010C	INORGANIC	LCS	1203928814	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203926279	MB	17	0	0	0
SW-846:6010C	INORGANIC	MB	1203928813	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148061	1203926219	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148061	1203926220	MS	0	0	11	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:6020	INORGANIC	CAMO-18-148061	438505001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148062	438505005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148063	1203928824	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148063	1203928825	MS	0	0	11	0
SW-846:6020	INORGANIC	CAMO-18-148063	438505012	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-148064	438505010	TEST	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203926218	LCS	0	0	11	0
SW-846:6020	INORGANIC	LCS	1203928823	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203926217	MB	11	0	0	0
SW-846:6020	INORGANIC	MB	1203928822	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148061	438505001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148062	438505005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148063	438505012	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148064	438505010	TEST	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148067	1203931740	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-148067	1203931741	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203931739	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203931738	MB	1	0	0	0
SW-846:8260B	VOC	CAMO-18-148077	438505002	REG	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148078	438505006	REG	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148079	438505008	REG	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148080	438505011	TEST	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148100	438505003	FTB	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148101	438505007	FTB	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148102	438505009	FTB	80	3	0	0
SW-846:8260B	VOC	CAMO-18-148112	438505004	FB	80	3	0	0
SW-846:8260B	VOC	LCS	1203927944	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203927945	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203927946	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203927947	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203927942	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203927943	MB	80	3	0	0
SW-846:8270D	SVOC	CAMO-18-148077	1203926422	MS	0	6	76	0
SW-846:8270D	SVOC	CAMO-18-148077	1203926423	MSD	0	6	76	0
SW-846:8270D	SVOC	CAMO-18-148077	438505002	REG	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-148078	438505006	REG	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-148079	438505008	REG	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-148080	438505011	TEST	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-148112	438505004	FB	80	6	0	0
SW-846:8270D	SVOC	LCS	1203926421	LCS	0	6	76	0

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Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8270D	SVOC	MB	1203926420	MB	80	6	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-148077	438505002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-148078	438505006	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-148079	438505008	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-148080	438505011	TEST	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CASA-18-147963	1203927021	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203927019	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203927018	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203926135	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.032	J	mg/L	0.050
MB	1203926279	METHOD BLANK	SW-846:6010C	W	Calcium	-60.9	J	ug/L	200
MB	1203926279	METHOD BLANK	SW-846:6010C	W	Potassium	77.3	J	ug/L	150
MB	1203928813	METHOD BLANK	SW-846:6010C	W	Potassium	73.8	J	ug/L	150
CAMO-18-148100	438505003	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAMO-18-148112	438505004	FIELD BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAMO-18-148101	438505007	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAMO-18-148101	438505007	TRIP BLANK	SW-846:8260B	W	Methylene Chloride	1.05	J	ug/L	10.0
CAMO-18-148102	438505009	TRIP BLANK	EPA:170.0	W	Temperature	2		Deg C	
CAMO-18-148102	438505009	TRIP BLANK	SW-846:8260B	W	Methylene Chloride	1.18	J	ug/L	10.0

DATA VALIDATION REPORT

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAMO-18-148061	1203926135	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.032	mg/L	0.0308	J	0.050	Y	5	100	Y
CAMO-18-148062	1203926135	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.032	mg/L	0.144		0.050	Y	5	100	Y
CAMO-18-148064	1203926135	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.032	mg/L	0.0296	J	0.050	Y	5	100	Y
CAMO-18-148061	1203926279	METHOD BLANK	SW-846:6010C	Calcium	-60.9	ug/L	11900		200	Y			
CAMO-18-148062	1203926279	METHOD BLANK	SW-846:6010C	Calcium	-60.9	ug/L	12400		200	Y			
CAMO-18-148064	1203926279	METHOD BLANK	SW-846:6010C	Calcium	-60.9	ug/L	16100		200	Y			
CAMO-18-148078	438505007	TRIP BLANK	SW-846:8260B	Methylene Chloride	1.05	ug/L	1.06	J	10.0	Y	5	100	Y
CAMO-18-148079	438505009	TRIP BLANK	SW-846:8260B	Methylene Chloride	1.18	ug/L	1.2	J	10.0	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAMO-18-148077	1203926151		EPA:335.4	Cyanide (Total)	1721218	11-28-2017	W	113		110	90	10		
CAMO-18-148077	1203926151		EPA:335.4	Cyanide (Total)	1721218	11-28-2017	W	113		110	90	10		
CAMO-18-148061	1203926142		EPA:350.1	Ammonia as Nitrogen	1721370	11-27-2017	W	77.1		110	90	10		
CAMO-18-148061	1203926142		EPA:350.1	Ammonia as Nitrogen	1721370	11-27-2017	W	77.1		110	90	10		
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Benzo(g,h,i)perylene	1721501	11-28-2017	W	52	78	126	24		40	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Chloronaphthalene[2-]	1721501	11-28-2017	W	55	75	113	29		31	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Dibenz(a,h)anthracene	1721501	11-28-2017	W	57	84	125	30		38	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Hexachlorobutadiene	1721501	11-28-2017	W	50	69	98	26		33	30

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
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Hexachlorocyclopentadiene	1721501	11-28-2017	W	34	47	79	26		31	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Indeno(1,2,3-cd)pyrene	1721501	11-28-2017	W	55	81	121	27		38	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Methylnaphthalene[1-]	1721501	11-28-2017	W	55	78	112	33		34	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Methylnaphthalene[2-]	1721501	11-28-2017	W	53	75	109	29		34	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Naphthalene	1721501	11-28-2017	W	54	74	108	31		32	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Tetrachlorobenzene[1,2,4,5]	1721501	11-28-2017	W	54	75	101	32		32	30
CAMO-18-148077	1203926422	1203926423	SW-846:8270D	Trichlorobenzene[1,2,4-]	1721501	11-28-2017	W	54	74	102	26		32	30

8. Any LCS/LCSD or BS/BSR 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?

Field Sample ID	Lab Sample ID	LD Lab Sample ID	Analytical Method	Parameter Name	Sample Matrix	Lab Result	LD Lab Result	Lab Units	Detect Flag	LD Detect Flag	RPD	RPD Limit
CAMO-18-148063	438505012	1203929078	EPA:160.1	Total Dissolved	W	177	163	mg/L	Y	Y	8.4	5
CAMO-18-148078	438505006	1203930062	EPA:900	Gross beta	W	2.36	3.35	pCi/L	Y	Y	34.6	20
CAMO-18-148077	438505002	1203927931	HASL-300:ISOU	Uranium-238	W	0.172	0.216	pCi/L	Y	Y	22.5	20

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

DATA VALIDATION REPORT

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Paramter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-44 S1	2018-1038	CAMO-18-148061	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.0308	mg/L	0.0308	mg/L			W	11/20/2017		1721371	VAL	Y
R-44 S2	2018-1038	CAMO-18-148062	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N	0.144	mg/L	0.144	mg/L			W	11/20/2017		1721371	VAL	Y
R-45 S2	2018-1038	CAMO-18-148064	TEST	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J	U	I4	N	0.0296	mg/L	0.0296	mg/L			W	11/20/2017		1721371	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00689	pCi/L	0.00689	pCi/L	0.0409	0.00608	W	11/20/2017		1722107	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.115	pCi/L	0.115	pCi/L	4.36	1.18	W	11/20/2017		1721601	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.268	pCi/L	0.268	pCi/L	4.19	0.999	W	11/20/2017		1721601	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	INORGANIC	EPA:335.4	Cyanide (Total)	U	UJ	I6b	N	1.67	ug/L	0.00167	mg/L			W	11/20/2017		1721219	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	1.27	pCi/L	1.27	pCi/L	2.17	0.680	W	11/20/2017		1722977	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	0.896	pCi/L	0.896	pCi/L	8.10	2.15	W	11/20/2017		1721601	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00652	pCi/L	0.00652	pCi/L	0.032	0.00721	W	11/20/2017		1722108	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00217	pCi/L	0.00217	pCi/L	0.0458	0.00841	W	11/20/2017		1722108	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	22	pCi/L	22	pCi/L	68.1	16.2	W	11/20/2017		1721601	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.509	pCi/L	-0.509	pCi/L	3.56	0.918	W	11/20/2017		1721601	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.0922	pCi/L	-0.0922	pCi/L	0.479	0.132	W	11/20/2017		1723383	VAL	Y
R-44 S1	2018-1038	CAMO-18-148077	REG	INIT	RAD	HASL-300:ISOU	Uranium-238		J	R10	Y	0.172	pCi/L	0.172	pCi/L	0.0696	0.0219	W	11/20/2017		1722109	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00373	pCi/L	0.00373	pCi/L	0.0332	0.00645	W	11/20/2017		1722107	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.709	pCi/L	-0.709	pCi/L	5.01	1.39	W	11/20/2017		1721601	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	2.39	pCi/L	2.39	pCi/L	6.91	1.47	W	11/20/2017		1721601	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	0.535	pCi/L	0.535	pCi/L	2.48	0.650	W	11/20/2017		1722977	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:900	Gross beta		J	R10	Y	2.36	pCi/L	2.36	pCi/L	2.06	0.729	W	11/20/2017		1722977	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	VOC	SW-846:8260B	Methylene Chloride	J	U	V4d	N	1.06	ug/L	1.06	ug/L			W	11/20/2017		1722112	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-0.54	pCi/L	-0.54	pCi/L	9.50	2.81	W	11/20/2017		1721601	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0	pCi/L	0	pCi/L	0.0364	0.00854	W	11/20/2017		1722108	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00247	pCi/L	-0.00247	pCi/L	0.052	0.0118	W	11/20/2017		1722108	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-4.41	pCi/L	-4.41	pCi/L	84.3	21.7	W	11/20/2017		1721601	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-1.76	pCi/L	-1.76	pCi/L	4.64	1.35	W	11/20/2017		1721601	VAL	Y
R-44 S2	2018-1038	CAMO-18-148078	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.31	pCi/L	-0.31	pCi/L	0.482	0.106	W	11/20/2017		1723383	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0	pCi/L	0	pCi/L	0.043	0.00904	W	11/20/2017		1722107	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	0.155	pCi/L	0.155	pCi/L	4.11	1.06	W	11/20/2017		1721601	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.178	pCi/L	0.178	pCi/L	4.92	1.17	W	11/20/2017		1721601	VAL	Y

DATA VALIDATION REPORT

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	2.1	pCi/L	2.1	pCi/L	2.85	0.948	W	11/20/2017		1722977	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	2.24	pCi/L	2.24	pCi/L	2.24	0.772	W	11/20/2017		1722977	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	VOC	SW-846:8260B	Methylene Chloride	J	U	V4d	N	1.2	ug/L	1.2	ug/L			W	11/20/2017		1722112	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	7.51	pCi/L	7.51	pCi/L	12.5	3.13	W	11/20/2017		1721601	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00833	pCi/L	0.00833	pCi/L	0.0307	0.00659	W	11/20/2017		1722108	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.0146	pCi/L	0.0146	pCi/L	0.0439	0.00859	W	11/20/2017		1722108	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5a	N	48.2	pCi/L	48.2	pCi/L	48.1	28.3	W	11/20/2017		1721601	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.288	pCi/L	0.288	pCi/L	4.85	1.14	W	11/20/2017		1721601	VAL	Y
R-45 S1	2018-1038	CAMO-18-148079	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.208	pCi/L	-0.208	pCi/L	0.488	0.130	W	11/20/2017		1723383	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00649	pCi/L	0.00649	pCi/L	0.0385	0.0078	W	11/20/2017		1722107	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.429	pCi/L	-0.429	pCi/L	4.12	1.17	W	11/20/2017		1721601	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.588	pCi/L	-0.588	pCi/L	3.94	1.07	W	11/20/2017		1721601	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:900	Gross beta	U	U	R5	N	1.7	pCi/L	1.7	pCi/L	2.03	0.676	W	11/20/2017		1722977	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-0.951	pCi/L	-0.951	pCi/L	6.89	1.89	W	11/20/2017		1721601	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00601	pCi/L	0.00601	pCi/L	0.0339	0.011	W	11/20/2017		1722108	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0.00986	pCi/L	0.00986	pCi/L	0.049	0.0103	W	11/20/2017		1722108	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-17.9	pCi/L	-17.9	pCi/L	51.8	14.7	W	11/20/2017		1721601	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.139	pCi/L	-0.139	pCi/L	3.87	1.15	W	11/20/2017		1721601	VAL	Y
R-45 S2	2018-1038	CAMO-18-148080	TEST	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.0943	pCi/L	-0.0943	pCi/L	0.467	0.112	W	11/20/2017		1723383	VAL	Y

Reason Code

Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
I6b	The associated matrix spike recovery was above the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package.
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample.
R10	Associated duplicate sample has DER or RER> the analytical laboratory's acceptance limits.
R5	Analyte is not detected because the amount reported is less than the MDC.
R5a	The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.

DATA VALIDATION REPORT

Reason Code

Description

U_LAB The analytical laboratory qualified the analyte as not detected.

V4d The samples result is ≤ 5 x the concentration of the related analyte in the trip, rinsate and/or equipment blank.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-148061	R-44 S1	REG	EPA:120.1	0	1
CAMO-18-148061	R-44 S1	REG	EPA:150.1	0	1
CAMO-18-148061	R-44 S1	REG	EPA:160.1	0	1
CAMO-18-148061	R-44 S1	REG	EPA:170.0	0	1
CAMO-18-148061	R-44 S1	REG	EPA:245.2	0	1
CAMO-18-148061	R-44 S1	REG	EPA:300.0	0	4
CAMO-18-148061	R-44 S1	REG	EPA:310.1	0	2
CAMO-18-148061	R-44 S1	REG	EPA:350.1	0	1
CAMO-18-148061	R-44 S1	REG	EPA:353.2	0	1
CAMO-18-148061	R-44 S1	REG	EPA:365.4	0	1
CAMO-18-148061	R-44 S1	REG	SM:A2340B	0	1
CAMO-18-148061	R-44 S1	REG	SW-846:6010C	0	17
CAMO-18-148061	R-44 S1	REG	SW-846:6020	0	11
CAMO-18-148061	R-44 S1	REG	SW-846:6850	0	1
CAMO-18-148062	R-44 S2	REG	EPA:120.1	0	1
CAMO-18-148062	R-44 S2	REG	EPA:150.1	0	1
CAMO-18-148062	R-44 S2	REG	EPA:160.1	0	1
CAMO-18-148062	R-44 S2	REG	EPA:170.0	0	1
CAMO-18-148062	R-44 S2	REG	EPA:245.2	0	1
CAMO-18-148062	R-44 S2	REG	EPA:300.0	0	4
CAMO-18-148062	R-44 S2	REG	EPA:310.1	0	2
CAMO-18-148062	R-44 S2	REG	EPA:350.1	0	1
CAMO-18-148062	R-44 S2	REG	EPA:353.2	0	1
CAMO-18-148062	R-44 S2	REG	EPA:365.4	0	1
CAMO-18-148062	R-44 S2	REG	SM:A2340B	0	1
CAMO-18-148062	R-44 S2	REG	SW-846:6010C	0	17
CAMO-18-148062	R-44 S2	REG	SW-846:6020	0	11
CAMO-18-148062	R-44 S2	REG	SW-846:6850	0	1
CAMO-18-148063	R-45 S1	REG	EPA:120.1	0	1
CAMO-18-148063	R-45 S1	REG	EPA:150.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-148063	R-45 S1	REG	EPA:160.1	0	1
CAMO-18-148063	R-45 S1	REG	EPA:170.0	0	1
CAMO-18-148063	R-45 S1	REG	EPA:245.2	0	1
CAMO-18-148063	R-45 S1	REG	EPA:300.0	0	4
CAMO-18-148063	R-45 S1	REG	EPA:310.1	0	2
CAMO-18-148063	R-45 S1	REG	EPA:350.1	0	1
CAMO-18-148063	R-45 S1	REG	EPA:353.2	0	1
CAMO-18-148063	R-45 S1	REG	EPA:365.4	0	1
CAMO-18-148063	R-45 S1	REG	SM:A2340B	0	1
CAMO-18-148063	R-45 S1	REG	SW-846:6010C	0	17
CAMO-18-148063	R-45 S1	REG	SW-846:6020	0	11
CAMO-18-148063	R-45 S1	REG	SW-846:6850	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:120.1	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:150.1	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:160.1	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:170.0	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:245.2	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:300.0	0	4
CAMO-18-148064	R-45 S2	TEST	EPA:310.1	0	2
CAMO-18-148064	R-45 S2	TEST	EPA:350.1	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:353.2	0	1
CAMO-18-148064	R-45 S2	TEST	EPA:365.4	0	1
CAMO-18-148064	R-45 S2	TEST	SM:A2340B	0	1
CAMO-18-148064	R-45 S2	TEST	SW-846:6010C	0	17
CAMO-18-148064	R-45 S2	TEST	SW-846:6020	0	11
CAMO-18-148064	R-45 S2	TEST	SW-846:6850	0	1
CAMO-18-148077	R-44 S1	REG	EPA:170.0	0	1
CAMO-18-148077	R-44 S1	REG	EPA:245.2	0	1
CAMO-18-148077	R-44 S1	REG	EPA:335.4	0	1
CAMO-18-148077	R-44 S1	REG	EPA:351.2	0	1
CAMO-18-148077	R-44 S1	REG	EPA:900	0	2
CAMO-18-148077	R-44 S1	REG	EPA:901.1	0	5
CAMO-18-148077	R-44 S1	REG	EPA:905.0	0	1
CAMO-18-148077	R-44 S1	REG	HASL-300:AM-241	0	1
CAMO-18-148077	R-44 S1	REG	HASL-300:ISOPU	0	2
CAMO-18-148077	R-44 S1	REG	HASL-300:ISOU	0	3
CAMO-18-148077	R-44 S1	REG	SW-846:8260B	0	80

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-148077	R-44 S1	REG	SW-846:8270D	0	80
CAMO-18-148077	R-44 S1	REG	SW-846:9060	0	1
CAMO-18-148078	R-44 S2	REG	EPA:170.0	0	1
CAMO-18-148078	R-44 S2	REG	EPA:245.2	0	1
CAMO-18-148078	R-44 S2	REG	EPA:335.4	0	1
CAMO-18-148078	R-44 S2	REG	EPA:351.2	0	1
CAMO-18-148078	R-44 S2	REG	EPA:900	0	2
CAMO-18-148078	R-44 S2	REG	EPA:901.1	0	5
CAMO-18-148078	R-44 S2	REG	EPA:905.0	0	1
CAMO-18-148078	R-44 S2	REG	HASL-300:AM-241	0	1
CAMO-18-148078	R-44 S2	REG	HASL-300:ISOPU	0	2
CAMO-18-148078	R-44 S2	REG	HASL-300:ISOU	0	3
CAMO-18-148078	R-44 S2	REG	SW-846:8260B	0	80
CAMO-18-148078	R-44 S2	REG	SW-846:8270D	0	80
CAMO-18-148078	R-44 S2	REG	SW-846:9060	0	1
CAMO-18-148079	R-45 S1	REG	EPA:170.0	0	1
CAMO-18-148079	R-45 S1	REG	EPA:245.2	0	1
CAMO-18-148079	R-45 S1	REG	EPA:335.4	0	1
CAMO-18-148079	R-45 S1	REG	EPA:351.2	0	1
CAMO-18-148079	R-45 S1	REG	EPA:900	0	2
CAMO-18-148079	R-45 S1	REG	EPA:901.1	0	5
CAMO-18-148079	R-45 S1	REG	EPA:905.0	0	1
CAMO-18-148079	R-45 S1	REG	HASL-300:AM-241	0	1
CAMO-18-148079	R-45 S1	REG	HASL-300:ISOPU	0	2
CAMO-18-148079	R-45 S1	REG	HASL-300:ISOU	0	3
CAMO-18-148079	R-45 S1	REG	SW-846:8260B	0	80
CAMO-18-148079	R-45 S1	REG	SW-846:8270D	0	80
CAMO-18-148079	R-45 S1	REG	SW-846:9060	0	1
CAMO-18-148080	R-45 S2	TEST	EPA:170.0	0	1
CAMO-18-148080	R-45 S2	TEST	EPA:245.2	0	1
CAMO-18-148080	R-45 S2	TEST	EPA:335.4	0	1
CAMO-18-148080	R-45 S2	TEST	EPA:351.2	0	1
CAMO-18-148080	R-45 S2	TEST	EPA:900	0	2
CAMO-18-148080	R-45 S2	TEST	EPA:901.1	0	5
CAMO-18-148080	R-45 S2	TEST	EPA:905.0	0	1
CAMO-18-148080	R-45 S2	TEST	HASL-300:AM-241	0	1
CAMO-18-148080	R-45 S2	TEST	HASL-300:ISOPU	0	2

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-148080	R-45 S2	TEST	HASL-300:ISOU	0	3
CAMO-18-148080	R-45 S2	TEST	SW-846:8260B	0	80
CAMO-18-148080	R-45 S2	TEST	SW-846:8270D	0	80
CAMO-18-148080	R-45 S2	TEST	SW-846:9060	0	1
CAMO-18-148100	R-44 S1	FTB	EPA:170.0	0	1
CAMO-18-148100	R-44 S1	FTB	SW-846:8260B	0	80
CAMO-18-148101	R-44 S2	FTB	EPA:170.0	0	1
CAMO-18-148101	R-44 S2	FTB	SW-846:8260B	0	80
CAMO-18-148102	R-45 S1	FTB	EPA:170.0	0	1
CAMO-18-148102	R-45 S1	FTB	SW-846:8260B	0	80
CAMO-18-148112	R-44 S1	FB	EPA:170.0	0	1
CAMO-18-148112	R-44 S1	FB	SW-846:8260B	0	80
CAMO-18-148112	R-44 S1	FB	SW-846:8270D	0	80

December 18, 2017

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

Re: LANL- WQH Water Samples
Work Order: 438505
SDG: 2018-1038

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on November 22, 2017, and analyzed for GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,



Valerie Davis
Project Manager

Chain of Custody: 2018-1038
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 438505
SDG: 2018-1038

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 438505
SDG # : 2018-1038**

December 18, 2017

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on November 22, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). Please see attached email for receipt discrepancies.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
438505001	CAMO-18-148061
438505002	CAMO-18-148077
438505003	CAMO-18-148100
438505004	CAMO-18-148112
438505005	CAMO-18-148062
438505006	CAMO-18-148078
438505007	CAMO-18-148101
438505008	CAMO-18-148079
438505009	CAMO-18-148102
438505010	CAMO-18-148064
438505011	CAMO-18-148080
438505012	CAMO-18-148063

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: GC/MS Semivolatile, GC/MS Volatile, General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry.

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.

A handwritten signature in black ink that reads "Valerie Davis". The script is cursive and fluid.

Valerie Davis
Project Manager

List of current GEL Certifications as of 18 December 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 21NOV17
ACTWGT: 51.0 LB MAN
CAD: 0014176/CAFE2916

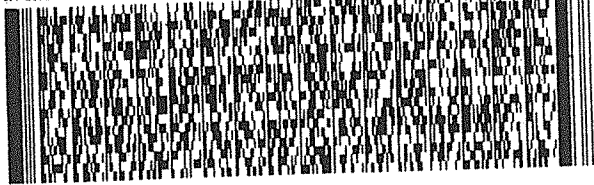
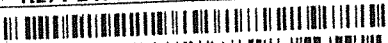
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PDOASRGW04BAGWEO



2 of 3

MPS# 5908 1783 2419
0263

Mstr# 5908 1783 2408

0201

X1 RBWA

29407
SC-US CHS

WED - 22 NOV 8:00/
FIRST OVERNIGHT



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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 21NOV17
ACTWGT: 57.0 LB MAN
CAD: 0014176/CAFE2916

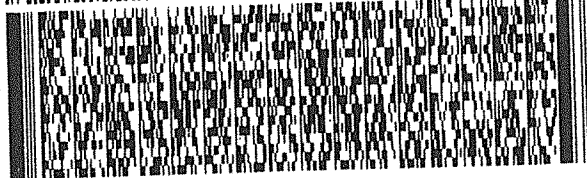
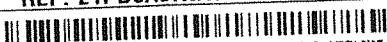
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PDOASRGW04BAGWEO



1 of 3

TRK# 5908 1783 2408
0201

MASTER

X1 RBWA

29407
SC-US CHS

WED - 22 NOV 8:00/
FIRST OVERNIGHT

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

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 21NOV17
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2916

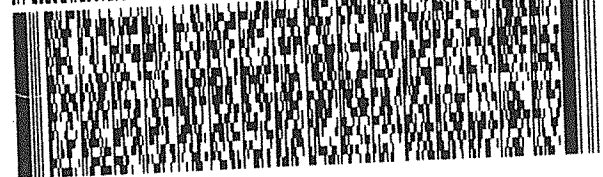
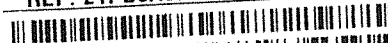
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PDOASRD06BDBD00



TRK# 5908 1783 2430
0201

X7 RBWA

29407
SC-US CHS

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PRIORITY OVERNIGHT



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151969 REV 7/08 RAD

LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

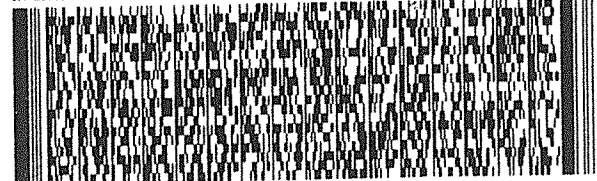
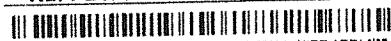
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PDOASRGW04BAGWEO



3 of 3

MPS# 5908 1783 2420
0263

Mstr# 5908 1783 2408

0201

X1 RBWA

29407
SC-US CHS

WED - 22 NOV 8:00/
FIRST OVERNIGHT

SAMPLE RECEIPT & REVIEW FORM

Client: ESTC		SDG/AR/COC/Work Order: 438505/438515	
Received By: ZKW		Date Received: 11/22/17	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other 5908 1783 2430 5908 1783 2420 5908 1783 2408 5908 1783 2419	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM /mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <input checked="" type="checkbox"/> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 2°C
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: WST Samples read/expressed If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> (If unknown, select No) VOA vials free of headspace? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Sample ID's and containers affected: -148100, -148101, and -148102 read with headspace
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

*** We didn't receive:**
GAB - for -148077
Anions - for -142758
Metals - for -146440

We read the following not on any COC:
CAMO-18-148063 11/20 @ 1101 (Metals, Perchlorate, NH₃+)
WST03-18-150038 11/15 @ 02:11
(Metals, TSS, CoD, Anions, H₃, GAB

PM (or PMA) review: Initials **HH**Date **11/29/17**Page **1** of **1**

Subject: Anticipate overnight shipment from ARS
From: "Mark, Paul" <paulmark@lanl.gov>
Date: 11/22/2017 3:53 PM
To: "Valerie Davis (vsd@gel.com)" <vsd@gel.com>, "team.DAVIS@GEL.COM" <team.DAVIS@GEL.COM>
CC: "Patel, Nita" <npatel@lanl.gov>, "sample_management@lanl.gov" <sample_management@lanl.gov>

Valerie,

We had a sample mix-up with shipments Tuesday, November 22. ARS received sample bottles for three samples GEL should have received. In the mix-up, I believe you also received today several bottles without a chain. Here is the situation as I see it after discussion with Valerie Davis.

ARS received three samples intended for GEL. ARS is going to send these to you today for overnight delivery. Expect them when you reopen after the Thanksgiving holiday:

- CTUA-17-142758 for ClO₄ +Anions on request number 2018-1051
- CTUA-17-146440 for WSP-All Metals on request number 2018-1051
- CAMO-18-148077 for WSP- GrossA/B on request number 2018-1038

ARS received analyses for tests they do not perform. I will generate a request to GEL for these analyses for three samples for analysis of ClO₄+Anions, TKN+NH₃+PO₄+NO₂/NO₃, and WSP-Cn(T):

- WST03-18-149992 ClO₄+Anions, TKN+NH₃+PO₄+NO₂/NO₃, and WSP-Cn(T)
- WST03-18-150037 ClO₄+Anions, TKN+NH₃+PO₄+NO₂/NO₃, and WSP-Cn(T)
- WST03-18-150038 ClO₄+Anions, TKN+NH₃+PO₄+NO₂/NO₃, and WSP-Cn(T).

I believe GEL received samples today without a chain of custody for field sample ID WST03-18-150038 for analyses of COD Gamma Spec+GrossA/B, H₃, TSS, and WSP-All Metals. I will include these analyses in a request to GEL. I will send this request in a separate email.

GEL received field sample ID today CAMO-18-148063 for analyses of WSP-All Metals, WSP-GENINORG+Perchlorate, and WSP-NH₃_NO₃/NO₂+PO₄ without a chain of custody. This sample should have been received on Request Number 2018-1038. I have added the field sample ID and tests to the chain and have attached the revised chain to this email.

I apologize for the sample confusion. Let me know if anything else seems to be amiss. Thank you,

Paul Mark
Sample Management Office
Adelante Consulting
paulmark@adelanteconsulting.com
(505) 695-0474

— Attachments: —

2018-1038 Rev1 11-22-2017.pdf

27 bytes

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

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

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

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

Volatile Analysis

Case Narrative

**GC/MS Volatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1038
Work Order #: 438505**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1722112

Sample Analysis

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

Sample ID	Client ID
438505002	CAMO-18-148077
438505003	CAMO-18-148100
438505004	CAMO-18-148112
438505006	CAMO-18-148078
438505007	CAMO-18-148101
438505008	CAMO-18-148079
438505009	CAMO-18-148102
438505011	CAMO-18-148080
1203927942	Method Blank (MB)
1203927943	Method Blank (MB)
1203927944	Laboratory Control Sample (LCS)
1203927945	Laboratory Control Sample (LCS)
1203927946	Laboratory Control Sample (LCS)
1203927947	Laboratory Control Sample (LCS)
1203927948	438505002(CAMO-18-148077) Post Spike (PS)
1203927949	438505002(CAMO-18-148077) Post Spike (PS)
1203927950	438505002(CAMO-18-148077) Post Spike Duplicate (PSD)
1203927951	438505002(CAMO-18-148077) Post Spike Duplicate (PSD)

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

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

SOP Reference

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

Calibration Information

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

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

Target analytes were detected in the blank 1203927942 (MB) below the reporting limit.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 438505002 (CAMO-18-148077) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

Miscellaneous Information

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA6.I	Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler	HP6890N/HP5975	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

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: 2018-1038 GEL Work Order: 438505

The Qualifiers in this report are defined as follows:

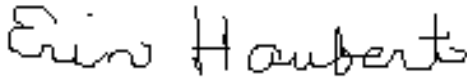
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- DL Indicates that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

Review/Validation

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

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

Signature:



Name: Erin Haubert

Date: 13 DEC 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505002

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 05:52

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 05:52

Data File: 112817V6\6J242.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505002

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 05:52

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 05:52

Data File: 112817V6\6J242.D

Column: DB-624

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505002

Client ID: CAMO-18-148077
Batch ID: 1722112
Run Date: 11/29/2017 05:52
Prep Date: 11/29/2017 05:52
Data File: 112817V6\6J242.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.0	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	51.5	50.0	ug/L 103	(70%-131%)
Toluene-d8	49.5	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	8.66	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505003

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148100

Batch ID: 1722112

Run Date: 11/29/2017 06:20

Prep Date: 11/29/2017 06:20

Data File: 112817V6\6J243.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038
Lab Sample ID: 438505003

Client ID: CAMO-18-148100
Batch ID: 1722112
Run Date: 11/29/2017 06:20
Prep Date: 11/29/2017 06:20
Data File: 112817V6\6J243.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505003

Client ID: CAMO-18-148100
Batch ID: 1722112
Run Date: 11/29/2017 06:20
Prep Date: 11/29/2017 06:20
Data File: 112817V6\6J243.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.7	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L 103	(70%-131%)
Toluene-d8	50.0	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	7.56	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505004

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 06:48

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 06:48

Data File: 112817V6\6J244.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1038
Lab Sample ID: 438505004

Client ID: CAMO-18-148112
Batch ID: 1722112
Run Date: 11/29/2017 06:48
Prep Date: 11/29/2017 06:48
Data File: 112817V6\6J244.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038

Lab Sample ID: 438505004

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 06:48

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 06:48

Column: DB-624

Data File: 112817V6\6J244.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.5	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	52.7	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.0	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.584	5.8	ug/L	0	J
	unknown siloxane	13.75	19.4	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505006

Date Collected: 11/20/2017 12:39

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 07:16

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 07:16

Data File: 112817V6\6J245.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505006

Date Collected: 11/20/2017 12:39

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148078

Batch ID: 1722112

Run Date: 11/29/2017 07:16

Prep Date: 11/29/2017 07:16

Data File: 112817V6\6J245.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.06	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505006

Client ID: CAMO-18-148078
Batch ID: 1722112
Run Date: 11/29/2017 07:16
Prep Date: 11/29/2017 07:16
Data File: 112817V6\6J245.D

Date Collected: 11/20/2017 12:39
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.1	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	52.2	50.0	ug/L 104	(70%-131%)
Toluene-d8	49.6	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	15.7	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505007

Date Collected: 11/20/2017 12:39

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148101

Batch ID: 1722112

Run Date: 11/29/2017 07:44

Prep Date: 11/29/2017 07:44

Data File: 112817V6\6J246.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	J	5.32	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038
Lab Sample ID: 438505007

Client ID: CAMO-18-148101
Batch ID: 1722112
Run Date: 11/29/2017 07:44
Prep Date: 11/29/2017 07:44
Data File: 112817V6\6J246.D

Date Collected: 11/20/2017 12:39
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.05	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038

Lab Sample ID: 438505007

Date Collected: 11/20/2017 12:39

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 07:44

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 07:44

Column: DB-624

Data File: 112817V6\6J246.D

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.3	50.0	ug/L 105	(71%-134%)
Bromofluorobenzene	51.8	50.0	ug/L 104	(70%-131%)
Toluene-d8	49.8	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.592	6.12	ug/L	0	J
	unknown siloxane	13.75	16.2	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505008

Date Collected: 11/20/2017 11:01

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 08:12

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 08:12

Data File: 112817V6\6J247.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038
Lab Sample ID: 438505008

Client ID: CAMO-18-148079
Batch ID: 1722112
Run Date: 11/29/2017 08:12
Prep Date: 11/29/2017 08:12
Data File: 112817V6\6J247.D

Date Collected: 11/20/2017 11:01
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.20	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505008

Client ID: CAMO-18-148079
Batch ID: 1722112
Run Date: 11/29/2017 08:12
Prep Date: 11/29/2017 08:12
Data File: 112817V6\6J247.D

Date Collected: 11/20/2017 11:01
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.2	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L 103	(70%-131%)
Toluene-d8	49.4	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	17.2	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505009

Date Collected: 11/20/2017 11:01

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 08:40

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 08:40

Data File: 112817V6\6J248.D

Column: DB-624

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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038
Lab Sample ID: 438505009

Client ID: CAMO-18-148102
Batch ID: 1722112
Run Date: 11/29/2017 08:40
Prep Date: 11/29/2017 08:40
Data File: 112817V6\6J248.D

Date Collected: 11/20/2017 11:01
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.18	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505009

Client ID: CAMO-18-148102
Batch ID: 1722112
Run Date: 11/29/2017 08:40
Prep Date: 11/29/2017 08:40
Data File: 112817V6\6J248.D

Date Collected: 11/20/2017 11:01
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.2	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	51.6	50.0	ug/L 103	(70%-131%)
Toluene-d8	48.7	50.0	ug/L 97	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.592	6.21	ug/L	0	J
	unknown siloxane	13.75	15.3	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505011

Date Collected: 11/20/2017 13:03

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148080

Batch ID: 1722112

Run Date: 11/29/2017 09:08

Prep Date: 11/29/2017 09:08

Data File: 112817V6\6J249.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Project: ESHL00114

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

Volatile
Certificate of Analysis
Sample Summary

Page 2 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505011

Date Collected: 11/20/2017 13:03

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1722112

Inst: VOA6.I

Dilution: 1

Run Date: 11/29/2017 09:08

Analyst: JP1

Purge Vol: 5 mL

Prep Date: 11/29/2017 09:08

Data File: 112817V6\6J249.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.22	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 438505011

Client ID: CAMO-18-148080
Batch ID: 1722112
Run Date: 11/29/2017 09:08
Prep Date: 11/29/2017 09:08
Data File: 112817V6\6J249.D

Date Collected: 11/20/2017 13:03
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	51.1	50.0	ug/L 102	(70%-131%)
Toluene-d8	49.4	50.0	ug/L 99	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	13.75	8.01	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1038**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203927944	LCS for batch 1722112	102	100	101
1203927945	LCS for batch 1722112	103	99	103
1203927942	MB for batch 1722112	102	98	101
438505002	CAMO-18-148077	106	99	103
438505003	CAMO-18-148100	103	100	103
438505004	CAMO-18-148112	107	100	105
438505006	CAMO-18-148078	104	99	104
438505007	CAMO-18-148101	105	100	104
438505008	CAMO-18-148079	104	99	103
438505009	CAMO-18-148102	106	97	103
438505011	CAMO-18-148080	106	99	102
1203927946	LCS for batch 1722112	104	100	102
1203927947	LCS for batch 1722112	104	99	105
1203927943	MB for batch 1722112	103	100	103
1203927948	CAMO-18-148077PS	102	100	99
1203927950	CAMO-18-148077PSD	103	100	100
1203927949	CAMO-18-148077PS	103	98	102
1203927951	CAMO-18-148077PSD	102	99	103

Surrogate**Acceptance Limits**

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927944

Instrument: VOA6.I

Analysis Date: 11/29/2017 00:14

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	95.5	96	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1310	105	61-125
67-64-1	LCS Acetone	250	0.0	222	89	48-157
74-88-4	LCS Iodomethane	250	0.0	249	99	72-128
75-15-0	LCS Carbon disulfide	250	0.0	252	101	69-138
108-05-4	LCS Vinyl acetate	250	0.0	240	96	67-125
78-93-3	LCS 2-Butanone	250	0.0	231	93	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	232	93	66-124
591-78-6	LCS 2-Hexanone	250	0.0	188	75	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	50.8	102	40-160
74-87-3	LCS Chloromethane	50.0	0.0	48.5	97	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	46.2	92	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.0	98	63-137
75-00-3	LCS Chloroethane	50.0	0.0	48.0	96	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	46.8	94	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	47.9	96	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	52.3	105	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	50.3	101	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	51.3	103	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.8	108	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	53.8	108	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	53.1	106	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927944

Instrument: VOA6.I

Analysis Date: 11/29/2017 00:14

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	47.1	94	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	52.4	105	76-125
67-66-3	LCS Chloroform	50.0	0.0	52.0	104	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	49.6	99	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	48.3	97	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	50.1	100	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	54.7	109	74-122
71-43-2	LCS Benzene	50.0	0.0	50.5	101	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	51.6	103	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	53.0	106	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	51.7	103	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	52.9	106	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	50.7	101	78-131
108-88-3	LCS Toluene	50.0	0.0	49.0	98	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	50.6	101	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	50.9	102	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	50.9	102	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	46.9	94	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	52.5	105	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	51.6	103	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	48.9	98	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	48.4	97	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927944

Instrument: VOA6.I

Analysis Date: 11/29/2017 00:14

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	48.5	97	74-126
100-42-5	LCS Styrene	50.0	0.0	49.0	98	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	47.2	94	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	48.2	96	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	49.3	99	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	48.1	96	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	46.4	93	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	48.3	97	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	47.3	95	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	47.5	95	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	47.9	96	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	48.3	97	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	47.5	95	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.6	95	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	46.8	94	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	47.0	94	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	45.4	91	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	46.2	92	72-136
91-20-3	LCS Naphthalene	50.0	0.0	50.2	100	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	47.4	95	70-130

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927944

Instrument: VOA6.I

Analysis Date: 11/29/2017 00:14

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	45.5	91	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	51.7	103	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	48.0	96	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5080	102	63-138

Volatile

Page 1 of 1

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927945

Instrument: VOA6.I

Analysis Date: 11/29/2017 01:10

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS Acrolein	250	0.0	197	79	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	243	97	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	260	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	250	100	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	237	95	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2560	102	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	44.8	90	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927946

Instrument: VOA6.I

Analysis Date: 11/29/2017 10:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	LCS m,p-Xylenes	100	0.0	97.3	97	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1250	100	61-125
67-64-1	LCS Acetone	250	0.0	292	117	48-157
74-88-4	LCS Iodomethane	250	0.0	240	96	72-128
75-15-0	LCS Carbon disulfide	250	0.0	255	102	69-138
108-05-4	LCS Vinyl acetate	250	0.0	252	101	67-125
78-93-3	LCS 2-Butanone	250	0.0	289	116	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	239	95	66-124
591-78-6	LCS 2-Hexanone	250	0.0	262	105	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	52.7	105	40-160
74-87-3	LCS Chloromethane	50.0	0.0	52.5	105	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	49.8	100	65-137
74-83-9	LCS Bromomethane	50.0	0.0	47.3	95	63-137
75-00-3	LCS Chloroethane	50.0	0.0	49.7	99	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	50.8	102	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	46.7	93	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.1	106	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	46.3	93	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	48.1	96	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	53.8	108	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	52.0	104	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	52.1	104	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927946

Instrument: VOA6.I

Analysis Date: 11/29/2017 10:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	LCS 2,2-Dichloropropane	50.0	0.0	50.8	102	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	48.8	98	76-125
67-66-3	LCS Chloroform	50.0	0.0	50.4	101	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	50.4	101	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	49.7	99	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	51.7	103	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	51.4	103	74-122
71-43-2	LCS Benzene	50.0	0.0	49.0	98	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	51.0	102	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	50.3	101	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	48.7	97	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	49.7	99	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	49.0	98	78-131
108-88-3	LCS Toluene	50.0	0.0	48.8	98	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	49.2	98	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	48.2	96	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	48.1	96	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	48.8	98	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	49.3	99	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	49.0	98	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	48.1	96	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	49.4	99	73-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927946

Instrument: VOA6.I

Analysis Date: 11/29/2017 10:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	LCS o-Xylene	50.0	0.0	48.3	97	74-126
100-42-5	LCS Styrene	50.0	0.0	48.2	96	72-130
75-25-2	LCS Bromoform	50.0	0.0	46.0	92	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	48.0	96	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	46.6	93	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	46.8	94	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	46.3	93	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	48.0	96	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	49.1	98	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	47.2	94	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	47.8	96	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	48.1	96	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	48.8	98	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	49.2	98	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	48.4	97	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	46.6	93	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	46.6	93	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	48.8	98	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	43.1	86	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	47.7	95	72-136
91-20-3	LCS Naphthalene	50.0	0.0	47.3	95	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	46.8	94	70-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927946

Instrument: VOA6.I

Analysis Date: 11/29/2017 10:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	47.0	94	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	49.6	99	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	46.8	94	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4900	98	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1722112

Matrix: WATER

Lab Sample ID 1203927947

Instrument: VOA6.I

Analysis Date: 11/29/2017 12:07

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	LCS	Acrolein	250	0.0	219	88	60-140
76-13-1	LCS	Trichlorotrifluoroethane	250	0.0	261	104	61-148
107-05-1	LCS	Allyl chloride	250	0.0	264	105	59-125
107-13-1	LCS	Acrylonitrile	250	0.0	271	108	65-122
107-12-0	LCS	Propionitrile	250	0.0	262	105	64-124
126-98-7	LCS	Methacrylonitrile	250	0.0	268	107	64-126
80-62-6	LCS	Methyl methacrylate	250	0.0	254	101	69-127
97-63-2	LCS	Ethyl methacrylate	250	0.0	242	97	66-130
78-83-1	LCS	Isobutyl alcohol	2500	0.0	2620	105	65-135
126-99-8	LCS	2-Chloro-1,3-butadiene	50.0	0.0	48.0	96	66-147

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike

Client ID: CAMO-18-148077PS

Matrix: W

Lab Sample ID 1203927948

Instrument: VOA6.I

Analysis Date: 11/29/2017 18:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
179601-23-1	PS m,p-Xylenes	100	0.00 U	96.6	97	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1270	102	56-131
67-64-1	PS Acetone	250	0.00 U	145	58	25-155
74-88-4	PS Iodomethane	250	0.00 U	248	99	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	257	103	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	229	92	48-133
78-93-3	PS 2-Butanone	250	0.00 U	175	70	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	227	91	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	168	67	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	50.1	100	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	49.2	98	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	46.8	94	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	51.9	104	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	47.9	96	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	47.7	95	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	46.0	92	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	53.0	106	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	48.9	98	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	49.4	99	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	54.6	109	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	53.6	107	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	53.2	106	69-127

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike

Client ID: CAMO-18-148077PS

Matrix: W

Lab Sample ID 1203927948

Instrument: VOA6.I

Analysis Date: 11/29/2017 18:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	49.0	98	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	50.4	101	71-130
67-66-3	PS Chloroform	50.0	0.00 U	52.0	104	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	49.9	100	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	49.0	98	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	51.0	102	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	53.5	107	69-130
71-43-2	PS Benzene	50.0	0.00 U	50.4	101	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	51.1	102	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	52.0	104	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	50.3	101	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	51.8	104	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	49.2	98	70-134
108-88-3	PS Toluene	50.0	0.00 U	49.4	99	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	49.9	100	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	49.7	99	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	50.3	101	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	48.1	96	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	52.0	104	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	50.7	101	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	48.8	98	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	49.1	98	61-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike

Client ID: CAMO-18-148077PS

Matrix: W

Lab Sample ID 1203927948

Instrument: VOA6.I

Analysis Date: 11/29/2017 18:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-47-6	PS o-Xylene	50.0	0.00 U	48.8	98	62-131
100-42-5	PS Styrene	50.0	0.00 U	48.1	96	59-135
75-25-2	PS Bromoform	50.0	0.00 U	47.4	95	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	47.8	96	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	48.1	96	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	49.0	98	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	47.2	94	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	46.6	93	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	48.6	97	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	47.0	94	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	47.2	94	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	48.3	97	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	48.2	96	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	48.1	96	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	48.1	96	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	46.3	93	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	46.1	92	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	45.9	92	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	42.5	85	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	45.4	91	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	47.3	95	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	45.8	92	52-135

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Post Spike

Client ID: CAMO-18-148077PS

Matrix: W

Lab Sample ID 1203927948

Instrument: VOA6.I

Analysis Date: 11/29/2017 18:42

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
120-82-1	PS	1,2,4-Trichlorobenzene	50.0	0.00	U	44.6	89	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	51.6	103	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	47.2	94	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	4720	94	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike Duplicate

Client ID: CAMO-18-148077PSD

Matrix: W

Lab Sample ID 1203927950

Instrument: VOA6.I

Analysis Date: 11/29/2017 19:09

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
179601-23-1	PSD m,p-Xylenes	100	0.00	U 96.8	97	59-132	0	0-20
75-05-8	PSD Acetonitrile	1250	0.00	U 1360	109	56-131	7	0-20
67-64-1	PSD Acetone	250	0.00	U 158	63	25-155	9	0-20
74-88-4	PSD Iodomethane	250	0.00	U 249	99	66-133	0	0-20
75-15-0	PSD Carbon disulfide	250	0.00	U 257	103	61-141	0	0-20
108-05-4	PSD Vinyl acetate	250	0.00	U 234	94	48-133	2	0-20
78-93-3	PSD 2-Butanone	250	0.00	U 190	76	25-143	8	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	U 243	97	61-127	7	0-20
591-78-6	PSD 2-Hexanone	250	0.00	U 182	73	33-138	8	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	U 49.2	98	33-164	2	0-20
74-87-3	PSD Chloromethane	50.0	0.00	U 47.4	95	53-139	4	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	U 45.4	91	58-140	3	0-20
74-83-9	PSD Bromomethane	50.0	0.00	U 50.6	101	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00	U 47.5	95	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	U 47.3	95	65-141	1	0-20
60-29-7	PSD Ethyl ether	50.0	0.00	U 47.0	94	69-127	2	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	U 52.8	106	59-130	1	0-20
75-09-2	PSD Methylene chloride	50.0	0.00	U 48.5	97	62-123	1	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	U 51.2	102	69-132	3	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	U 54.3	109	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	U 53.3	107	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	U 53.3	107	69-127	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike Duplicate

Client ID: CAMO-18-148077PSD

Matrix: W

Lab Sample ID 1203927950

Instrument: VOA6.I

Analysis Date: 11/29/2017 19:09

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00	U 48.9	98	66-137	0	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 51.4	103	71-130	2	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 52.2	104	71-129	0	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	U 50.5	101	69-139	1	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	U 49.5	99	67-130	1	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 50.9	102	66-143	0	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 54.3	109	69-130	1	0-20
71-43-2	PSD Benzene	50.0	0.00	U 50.3	101	66-125	0	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 51.1	102	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 52.1	104	67-127	0	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 51.5	103	72-129	2	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 52.0	104	70-138	0	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 49.9	100	70-134	2	0-20
108-88-3	PSD Toluene	50.0	0.00	U 49.7	99	60-126	1	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 51.2	102	69-135	3	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 51.0	102	66-125	2	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 51.5	103	67-124	2	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 48.4	97	60-130	1	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 52.7	105	68-143	1	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 52.2	104	71-127	3	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 49.3	99	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 49.4	99	61-130	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Post Spike Duplicate

Client ID: CAMO-18-148077PSD

Matrix: W

Lab Sample ID 1203927950

Instrument: VOA6.I

Analysis Date: 11/29/2017 19:09

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-47-6	PSD o-Xylene	50.0	0.00	U 48.9	98	62-131	0	0-20
100-42-5	PSD Styrene	50.0	0.00	U 47.8	96	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00	U 50.2	100	64-138	6	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	U 47.8	96	55-133	0	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	U 50.3	101	62-129	4	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	U 50.7	101	70-124	3	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	U 47.5	95	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	U 47.0	94	50-133	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	U 48.5	97	53-135	0	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	U 47.4	95	56-128	1	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	U 47.2	94	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	U 48.2	96	55-135	0	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	U 48.0	96	53-132	0	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	U 48.2	96	50-138	0	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	U 48.2	96	49-138	0	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	U 46.8	94	56-126	1	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	U 46.5	93	55-125	1	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	U 46.2	92	43-142	1	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00	U 48.4	97	62-141	13	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	U 45.1	90	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00	U 50.8	102	62-134	7	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	U 47.2	94	52-135	3	0-20

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Post Spike Duplicate

Client ID: CAMO-18-148077PSD

Matrix: W

Lab Sample ID 1203927950

Instrument: VOA6.I

Analysis Date: 11/29/2017 19:09

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	45.0	90	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	52.0	104	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	47.3	95	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	5260	105	60-140	11	0-20

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Post Spike

Client ID: CAMO-18-148077PS

Matrix: W

Lab Sample ID 1203927949

Instrument: VOA6.I

Analysis Date: 11/29/2017 20:33

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS	Acrolein	250	0.00	U	223	89	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	238	95	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	244	97	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	274	110	59-129
107-12-0	PS	Propionitrile	250	0.00	U	270	108	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	268	107	59-134
80-62-6	PS	Methyl methacrylate	250	0.00	U	256	102	62-135
97-63-2	PS	Ethyl methacrylate	250	0.00	U	242	97	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2750	110	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	43.1	86	63-146

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-1038

Sample Type: Post Spike Duplicate

Client ID: CAMO-18-148077PSD

Matrix: W

Lab Sample ID 1203927951

Instrument: VOA6.I

Analysis Date: 11/29/2017 21:01

Dilution: 1

Analyst: JP1

Purge Vol: 5 mL

Batch ID: 1722112

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00	U	216	86	49-141	3	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	U	242	97	57-149	2	0-20
107-05-1	PSD Allyl chloride	250	0.00	U	248	99	54-128	2	0-20
107-13-1	PSD Acrylonitrile	250	0.00	U	266	106	59-129	3	0-20
107-12-0	PSD Propionitrile	250	0.00	U	257	103	58-131	5	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	U	259	104	59-134	4	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	U	247	99	62-135	4	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	U	238	95	60-136	2	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	U	2570	103	60-143	7	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	U	44.6	89	63-146	3	0-20

Method Blank Summary

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SDG Number:	2018-1038	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1722112	Instrument ID:	VOA6.I	Data File:	112817V6\6J233BA12.D
Lab Sample ID:	1203927942	Prep Date:	11/29/2017 01:39	Analyzed:	11/29/17 01:39
Column:	DB-624				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1722112	1203927944	112817V6\6J230LA12.D	11/29/17	0014
02 LCS for batch 1722112	1203927945	112817V6\6J232LA12.D	11/29/17	0110
03 CAMO-18-148077	438505002	112817V6\6J242.D	11/29/17	0552
04 CAMO-18-148100	438505003	112817V6\6J243.D	11/29/17	0620
05 CAMO-18-148112	438505004	112817V6\6J244.D	11/29/17	0648
06 CAMO-18-148078	438505006	112817V6\6J245.D	11/29/17	0716
07 CAMO-18-148101	438505007	112817V6\6J246.D	11/29/17	0744
08 CAMO-18-148079	438505008	112817V6\6J247.D	11/29/17	0812
09 CAMO-18-148102	438505009	112817V6\6J248.D	11/29/17	0840
10 CAMO-18-148080	438505011	112817V6\6J249.D	11/29/17	0908

Method Blank Summary

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SDG Number: 2018-1038

Client: ARSL004

Matrix: WATER

Client ID: MB for batch 1722112

Instrument ID: VOA6.I

Data File: 112917V6\6J309BA.D

Lab Sample ID: 1203927943

Prep Date: 11/29/2017 13:31

Analyzed: 11/29/17 13:31

Column: DB-624

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
12 LCS for batch 1722112	1203927946	112917V6\6J303LA.D	11/29/17	1042
13 LCS for batch 1722112	1203927947	112917V6\6J306LA.D	11/29/17	1207
14 CAMO-18-148077PS	1203927948	112917V6\6J320.D	11/29/17	1842
15 CAMO-18-148077PSD	1203927950	112917V6\6J321.D	11/29/17	1909
16 CAMO-18-148077PS	1203927949	112917V6\6J324.D	11/29/17	2033
17 CAMO-18-148077PSD	1203927951	112917V6\6J325.D	11/29/17	2101

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038

Lab Sample ID: 1203927942

Client Sample: QC for batch 1722112

Client ID: MB for batch 1722112

Batch ID: 1722112

Run Date: 11/29/2017 01:39

Prep Date: 11/29/2017 01:39

Data File: 112817V6\6J233BA12.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	J	0.410	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	J	0.330	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927942
Client Sample: QC for batch 1722112
Client ID: MB for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 01:39
Prep Date: 11/29/2017 01:39
Data File: 112817V6\6J233BA12.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	J	0.490	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2018-1038	Matrix:	WATER
Lab Sample ID:	1203927942		
Client Sample:	QC for batch 1722112	Client:	ARSL004
Client ID:	MB for batch 1722112	Method:	SW-846:8260B
Batch ID:	1722112	Inst:	VOA6.I
Run Date:	11/29/2017 01:39	Analyst:	JP1
Prep Date:	11/29/2017 01:39		
Data File:	112817V6\6J233BA12.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.0	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	50.7	50.0	ug/L 101	(70%-131%)
Toluene-d8	48.9	50.0	ug/L 98	(74%-124%)

Tentatively Identified Compound Summary

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038

Lab Sample ID: 1203927943

Client Sample: QC for batch 1722112

Client ID: MB for batch 1722112

Batch ID: 1722112

Run Date: 11/29/2017 13:31

Prep Date: 11/29/2017 13:31

Data File: 112917V6\6J309BA.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

Column: DB-624

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

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Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927943
Client Sample: QC for batch 1722112
Client ID: MB for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 13:31
Prep Date: 11/29/2017 13:31
Data File: 112917V6\6J309BA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

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

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Sample Summary

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SDG Number:	2018-1038	Matrix:	WATER
Lab Sample ID:	1203927943		
Client Sample:	QC for batch 1722112	Client:	ARSL004
Client ID:	MB for batch 1722112	Method:	SW-846:8260B
Batch ID:	1722112	Inst:	VOA6.I
Run Date:	11/29/2017 13:31	Analyst:	JP1
Prep Date:	11/29/2017 13:31		
Data File:	112917V6\6J309BA.D	Column:	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.7	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	51.7	50.0	ug/L 103	(70%-131%)
Toluene-d8	49.9	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

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

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Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927944
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 00:14
Prep Date: 11/29/2017 00:14
Data File: 112817V6\6J230LA12.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		51.7	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.6	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		53.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.3	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		48.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	B	47.4	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	B	45.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		45.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		54.7	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		53.0	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		50.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		47.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.1	ug/L	0.300	1.00
78-93-3	2-Butanone		231	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.3	ug/L	0.300	1.00
591-78-6	2-Hexanone		188	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		232	ug/L	1.50	5.00
67-64-1	Acetone		222	ug/L	1.50	10.0
75-05-8	Acetonitrile		1310	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		50.5	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		52.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.9	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

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Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927944
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 00:14
Prep Date: 11/29/2017 00:14
Data File: 112817V6\6J230LA12.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		49.0	ug/L	0.300	1.00
75-15-0	Carbon disulfide		252	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		50.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene		48.9	ug/L	0.300	1.00
75-00-3	Chloroethane		48.0	ug/L	0.300	1.00
67-66-3	Chloroform		52.0	ug/L	0.300	1.00
74-87-3	Chloromethane		48.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		51.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		50.8	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	B	46.2	ug/L	0.300	1.00
74-88-4	Iodomethane		249	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		50.3	ug/L	1.00	10.0
91-20-3	Naphthalene		50.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		49.0	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		46.9	ug/L	0.300	1.00
108-88-3	Toluene		49.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.6	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		240	ug/L	1.50	5.00
75-01-4	Vinyl chloride		46.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		50.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		95.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5080	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		46.4	ug/L	0.300	1.00
95-47-6	o-Xylene		48.5	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.5	ug/L	0.300	1.00

**Volatile
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Sample Summary**

SDG Number:	2018-1038	Matrix:	WATER
Lab Sample ID:	1203927944		
Client Sample:	QC for batch 1722112	Client:	ARSL004
Client ID:	LCS for batch 1722112	Method:	SW-846:8260B
Batch ID:	1722112	Inst:	VOA6.I
Run Date:	11/29/2017 00:14	Analyst:	JP1
Prep Date:	11/29/2017 00:14	Purge Vol:	5 mL
Data File:	112817V6\6J230LA12.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.3	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		47.9	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		50.6	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.2	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	50.6	50.0	ug/L	101	(70%-131%)
Toluene-d8	50.1	50.0	ug/L	100	(74%-124%)

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Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038

Lab Sample ID: 1203927945

Client Sample: QC for batch 1722112

Client ID: LCS for batch 1722112

Batch ID: 1722112

Run Date: 11/29/2017 01:10

Prep Date: 11/29/2017 01:10

Data File: 112817V6\6J232LA12.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		44.8	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		197	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

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Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927945
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 01:10
Prep Date: 11/29/2017 01:10
Data File: 112817V6\6J232LA12.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		237	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2560	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		260	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		250	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		243	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 1203927945
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 01:10
Prep Date: 11/29/2017 01:10
Data File: 112817V6\6J232LA12.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.3	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	51.5	50.0	ug/L 103	(70%-131%)
Toluene-d8	49.3	50.0	ug/L 99	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927946
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 10:42
Prep Date: 11/29/2017 10:42
Data File: 112917V6\6J303LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		49.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.4	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		46.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.2	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.0	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.7	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		46.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		46.8	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		47.0	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.8	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		43.1	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		49.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		46.8	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.3	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		49.1	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		48.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.6	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		50.8	ug/L	0.300	1.00
78-93-3	2-Butanone		289	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		262	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.8	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.4	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		239	ug/L	1.50	5.00
67-64-1	Acetone		292	ug/L	1.50	10.0
75-05-8	Acetonitrile		1250	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		49.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		46.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		48.8	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		49.7	ug/L	0.300	1.00
75-25-2	Bromoform		46.0	ug/L	0.300	1.00

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Sample Summary**

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SDG Number: 2018-1038
Lab Sample ID: 1203927946
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 10:42
Prep Date: 11/29/2017 10:42
Data File: 112917V6\6J303LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		47.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		255	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.7	ug/L	0.300	1.00
108-90-7	Chlorobenzene		48.1	ug/L	0.300	1.00
75-00-3	Chloroethane		49.7	ug/L	0.300	1.00
67-66-3	Chloroform		50.4	ug/L	0.300	1.00
74-87-3	Chloromethane		52.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		49.3	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		52.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		46.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		49.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.7	ug/L	0.300	1.00
74-88-4	Iodomethane		240	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		48.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		46.3	ug/L	1.00	10.0
91-20-3	Naphthalene		47.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		48.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.8	ug/L	0.300	1.00
108-88-3	Toluene		48.8	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		50.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		252	ug/L	1.50	5.00
75-01-4	Vinyl chloride		49.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		52.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.0	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		97.3	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4900	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		48.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		48.0	ug/L	0.300	1.00
95-47-6	o-Xylene		48.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		49.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 1203927946
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 10:42
Prep Date: 11/29/2017 10:42
Data File: 112917V6\6J303LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		48.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		48.1	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		53.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		49.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.0	50.0	ug/L	104	(71%-134%)
Bromofluorobenzene	50.8	50.0	ug/L	102	(70%-131%)
Toluene-d8	50.2	50.0	ug/L	100	(74%-124%)

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Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038

Lab Sample ID: 1203927947

Client Sample: QC for batch 1722112

Client ID: LCS for batch 1722112

Batch ID: 1722112

Run Date: 11/29/2017 12:07

Prep Date: 11/29/2017 12:07

Data File: 112917V6\6J306LA.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA6.I

Analyst: JP1

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		48.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		219	ug/L	1.50	5.00
107-13-1	Acrylonitrile		271	ug/L	1.50	5.00
107-05-1	Allyl chloride		264	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927947
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 12:07
Prep Date: 11/29/2017 12:07
Data File: 112917V6\6J306LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		242	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2620	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		268	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		254	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		262	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		261	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038
Lab Sample ID: 1203927947
Client Sample: QC for batch 1722112
Client ID: LCS for batch 1722112
Batch ID: 1722112
Run Date: 11/29/2017 12:07
Prep Date: 11/29/2017 12:07
Data File: 112917V6\6J306LA.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: WATER

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

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.1	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	49.4	50.0	ug/L 99	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927948
Client Sample: QC for batch 1722112
Client ID: CAMO-18-148077PS
Batch ID: 1722112
Run Date: 11/29/2017 18:42
Prep Date: 11/29/2017 18:42
Data File: 112917V6\6J320.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		51.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		48.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		53.6	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.0	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		45.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.0	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		44.6	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		42.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		50.7	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		53.5	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		52.0	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.6	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.3	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		50.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.1	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		49.0	ug/L	0.300	1.00
78-93-3	2-Butanone		175	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.0	ug/L	0.300	1.00
591-78-6	2-Hexanone		168	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		227	ug/L	1.50	5.00
67-64-1	Acetone		145	ug/L	1.50	10.0
75-05-8	Acetonitrile		1270	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		50.4	ug/L	0.300	1.00
108-86-1	Bromobenzene		47.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		51.8	ug/L	0.300	1.00
75-25-2	Bromoform		47.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038	Date Collected: 11/20/2017 10:50	Matrix: W
Lab Sample ID: 1203927948	Date Received: 11/22/2017 08:55	
Client Sample: QC for batch 1722112	Client: ARSL004	Project: QC
Client ID: CAMO-18-148077PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1722112	Inst: VOA6.I	Dilution: 1
Run Date: 11/29/2017 18:42	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 11/29/2017 18:42		
Data File: 112917V6\6J320.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		51.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide		257	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		51.0	ug/L	0.300	1.00
108-90-7	Chlorobenzene		48.8	ug/L	0.300	1.00
75-00-3	Chloroethane		47.9	ug/L	0.300	1.00
67-66-3	Chloroform		52.0	ug/L	0.300	1.00
74-87-3	Chloromethane		49.2	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.0	ug/L	0.300	1.00
74-95-3	Dibromomethane		50.3	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		50.1	ug/L	0.300	1.00
60-29-7	Ethyl ether		46.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		49.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		45.4	ug/L	0.300	1.00
74-88-4	Iodomethane		248	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.9	ug/L	1.00	10.0
91-20-3	Naphthalene		47.3	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		48.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.1	ug/L	0.300	1.00
108-88-3	Toluene		49.4	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		229	ug/L	1.50	5.00
75-01-4	Vinyl chloride		46.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.2	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		96.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4720	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		46.6	ug/L	0.300	1.00
95-47-6	o-Xylene		48.8	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.1	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2018-1038	Date Collected:	11/20/2017 10:50	Matrix:	W
Lab Sample ID:	1203927948	Date Received:	11/22/2017 08:55		
Client Sample:	QC for batch 1722112	Client:	ARSL004	Project:	QC
Client ID:	CAMO-18-148077PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1722112	Inst:	VOA6.I	Dilution:	1
Run Date:	11/29/2017 18:42	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	11/29/2017 18:42				
Data File:	112917V6\6J320.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		49.4	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		48.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		54.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		49.9	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.0	50.0	ug/L	102	(71%-134%)
Bromofluorobenzene	49.7	50.0	ug/L	99	(70%-131%)
Toluene-d8	49.9	50.0	ug/L	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927949
Client Sample: QC for batch 1722112
Client ID: CAMO-18-148077PS
Batch ID: 1722112
Run Date: 11/29/2017 20:33
Prep Date: 11/29/2017 20:33
Data File: 112917V6\6J324.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		43.1	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		223	ug/L	1.50	5.00
107-13-1	Acrylonitrile		274	ug/L	1.50	5.00
107-05-1	Allyl chloride		244	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038
Lab Sample ID: 1203927949
Client Sample: QC for batch 1722112
Client ID: CAMO-18-148077PS
Batch ID: 1722112
Run Date: 11/29/2017 20:33
Prep Date: 11/29/2017 20:33
Data File: 112917V6\6J324.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		242	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2750	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		268	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		256	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		270	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		238	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2018-1038	Date Collected:	11/20/2017 10:50	Matrix:	W
Lab Sample ID:	1203927949	Date Received:	11/22/2017 08:55		
Client Sample:	QC for batch 1722112	Client:	ARSL004	Project:	QC
Client ID:	CAMO-18-148077PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1722112	Inst:	VOA6.I	Dilution:	1
Run Date:	11/29/2017 20:33	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	11/29/2017 20:33				
Data File:	112917V6\6J324.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.5	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	51.2	50.0	ug/L	102	(70%-131%)
Toluene-d8	49.0	50.0	ug/L	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-1038
Lab Sample ID: 1203927950
Client Sample: QC for batch 1722112
Client ID: CAMO-18-148077PSD
Batch ID: 1722112
Run Date: 11/29/2017 19:09
Prep Date: 11/29/2017 19:09
Data File: 112917V6\6J321.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		52.0	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		50.3	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		51.0	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		53.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		52.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		47.2	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		45.0	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		48.0	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		48.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.2	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		54.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		52.1	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.5	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		48.9	ug/L	0.300	1.00
78-93-3	2-Butanone		190	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		47.4	ug/L	0.300	1.00
591-78-6	2-Hexanone		182	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		48.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		243	ug/L	1.50	5.00
67-64-1	Acetone		158	ug/L	1.50	10.0
75-05-8	Acetonitrile		1360	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		50.3	ug/L	0.300	1.00
108-86-1	Bromobenzene		47.5	ug/L	0.300	1.00
74-97-5	Bromochloromethane		51.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.0	ug/L	0.300	1.00
75-25-2	Bromoform		50.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-1038	Date Collected: 11/20/2017 10:50	Matrix: W
Lab Sample ID: 1203927950	Date Received: 11/22/2017 08:55	
Client Sample: QC for batch 1722112	Client: ARSL004	Project: QC
Client ID: CAMO-18-148077PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1722112	Inst: VOA6.I	Dilution: 1
Run Date: 11/29/2017 19:09	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 11/29/2017 19:09		
Data File: 112917V6\6J321.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		50.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		257	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		50.9	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.3	ug/L	0.300	1.00
75-00-3	Chloroethane		47.5	ug/L	0.300	1.00
67-66-3	Chloroform		52.2	ug/L	0.300	1.00
74-87-3	Chloromethane		47.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		52.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		51.5	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		49.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.0	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		49.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		45.1	ug/L	0.300	1.00
74-88-4	Iodomethane		249	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		47.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	1.50	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	1.50	ug/L	1.50	5.00
75-09-2	Methylene chloride		48.5	ug/L	1.00	10.0
91-20-3	Naphthalene		50.8	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		47.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		48.4	ug/L	0.300	1.00
108-88-3	Toluene		49.7	ug/L	0.300	1.00
79-01-6	Trichloroethylene		51.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.3	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		234	ug/L	1.50	5.00
75-01-4	Vinyl chloride		45.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		53.3	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.9	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		96.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5260	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.2	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.0	ug/L	0.300	1.00
95-47-6	o-Xylene		48.9	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		48.2	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2018-1038	Date Collected:	11/20/2017 10:50	Matrix:	W
Lab Sample ID:	1203927950	Date Received:	11/22/2017 08:55		
Client Sample:	QC for batch 1722112	Client:	ARSL004	Project:	QC
Client ID:	CAMO-18-148077PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1722112	Inst:	VOA6.I	Dilution:	1
Run Date:	11/29/2017 19:09	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	11/29/2017 19:09				
Data File:	112917V6\6J321.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		48.2	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		54.3	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		51.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.4	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	50.2	50.0	ug/L	100	(70%-131%)
Toluene-d8	50.0	50.0	ug/L	100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-1038
Lab Sample ID: 1203927951
Client Sample: QC for batch 1722112
Client ID: CAMO-18-148077PSD
Batch ID: 1722112
Run Date: 11/29/2017 21:01
Prep Date: 11/29/2017 21:01
Data File: 112917V6\6J325.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOA6.I
Analyst: JP1

Column: DB-624

Matrix: W

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		44.6	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		216	ug/L	1.50	5.00
107-13-1	Acrylonitrile		266	ug/L	1.50	5.00
107-05-1	Allyl chloride		248	ug/L	1.50	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	0.300	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	0.300	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	0.300	ug/L	0.300	1.00
75-25-2	Bromoform	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-1038	Date Collected: 11/20/2017 10:50	Matrix: W
Lab Sample ID: 1203927951	Date Received: 11/22/2017 08:55	
Client Sample: QC for batch 1722112	Client: ARSL004	Project: QC
Client ID: CAMO-18-148077PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1722112	Inst: VOA6.I	Dilution: 1
Run Date: 11/29/2017 21:01	Analyst: JP1	Purge Vol: 5 mL
Prep Date: 11/29/2017 21:01		
Data File: 112917V6\6J325.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	0.300	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	1.50	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	1.00
75-00-3	Chloroethane	U	0.300	ug/L	0.300	1.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	1.00
74-87-3	Chloromethane	U	0.300	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	0.300	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	0.300	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	0.300	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	0.300	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		238	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2570	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		259	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		247	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		242	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2018-1038	Date Collected:	11/20/2017 10:50	Matrix:	W
Lab Sample ID:	1203927951	Date Received:	11/22/2017 08:55		
Client Sample:	QC for batch 1722112	Client:	ARSL004	Project:	QC
Client ID:	CAMO-18-148077PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1722112	Inst:	VOA6.I	Dilution:	1
Run Date:	11/29/2017 21:01	Analyst:	JP1	Purge Vol:	5 mL
Prep Date:	11/29/2017 21:01				
Data File:	112917V6\6J325.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.0	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	51.5	50.0	ug/L 103	(70%-131%)
Toluene-d8	49.3	50.0	ug/L 99	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1038
Work Order #: 438505**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1721502
Prep Batch Number:	1721501

Sample Analysis

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

Sample ID	Client ID
438505002	CAMO-18-148077
438505004	CAMO-18-148112
438505006	CAMO-18-148078
438505008	CAMO-18-148079
438505011	CAMO-18-148080
1203926420	Method Blank (MB)
1203926421	Laboratory Control Sample (LCS)
1203926422	438505002(CAMO-18-148077) Matrix Spike (MS)
1203926423	438505002(CAMO-18-148077) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

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

Calibration Information

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

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

Initial Calibration

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

CCV Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 438505002 (CAMO-18-148077) was selected for analysis as the matrix spike and matrix spike duplicate.

Spike Recovery Statement

The MS and MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD values between the MS and MSD, (See Below), were not within the acceptance limits due to the large difference between the individual recoveries in each MS and MSD analyte pair. The failures may be attributed to an error in the extraction process.

Sample	Analyte	Value
1203926422MS and 1203926423MSD (CAMO-18-148077)	Several	See applicable report

Internal Standard (ISTD) Acceptance

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

Technical Information:

Holding Time Specifications

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

Preparation/Analytical Method Verification

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

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information:

Manual Integrations

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

TIC Comment

Tentatively identified compounds (TIC) were requested for samples 438505002 (CAMO-18-148077), 438505004 (CAMO-18-148112), 438505006 (CAMO-18-148078), 438505008 (CAMO-18-148079) and 438505011 (CAMO-18-148080) in this SDG in this batch.

Additional Comments

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

Electronic Package Comment

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

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
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MSD4.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP6890/HP5973	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)
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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: 2018-1038 GEL Work Order: 438505

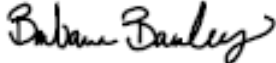
The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Barbara Bailey

Date: 01 DEC 2017

Title: Data Validator

Sample Data Summary

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

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505002

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 16:58

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2818.D

Column: DB-5ms

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

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

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SDG Number: 2018-1038

Lab Sample ID: 438505002

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 16:58

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2818.D

Column: DB-5ms

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

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

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SDG Number: 2018-1038

Lab Sample ID: 438505002

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 16:58

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2818.D

Column: DB-5ms

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	64.9	100	ug/L	65	(32%-124%)
2-Fluorobiphenyl	29.3	50.0	ug/L	59	(32%-112%)
2-Fluorophenol	37.7	100	ug/L	38	(15%-88%)
Nitrobenzene-d5	30.0	50.0	ug/L	60	(36%-115%)
Phenol-d5	23.6	100	ug/L	24	(15%-91%)
p-Terphenyl-d14	32.4	50.0	ug/L	65	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.013	4.46	ug/L	99	NJ

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

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SDG Number: 2018-1038

Lab Sample ID: 438505004

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148112

Batch ID: 1721502

Run Date: 11/28/2017 18:24

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2821.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 930 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.23	ug/L	3.23	10.8
120-82-1	1,2,4-Trichlorobenzene	U	3.23	ug/L	3.23	10.8
95-50-1	1,2-Dichlorobenzene	U	3.23	ug/L	3.23	10.8
122-66-7	Azobenzene	U	3.23	ug/L	3.23	10.8
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.23	ug/L	3.23	10.8
106-46-7	1,4-Dichlorobenzene	U	3.23	ug/L	3.23	10.8
123-91-1	1,4-Dioxane	U	3.23	ug/L	3.23	10.8
90-12-0	1-Methylnaphthalene	U	0.323	ug/L	0.323	1.08
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.23	ug/L	3.23	10.8
95-95-4	2,4,5-Trichlorophenol	U	3.23	ug/L	3.23	10.8
88-06-2	2,4,6-Trichlorophenol	U	3.23	ug/L	3.23	10.8
120-83-2	2,4-Dichlorophenol	U	3.23	ug/L	3.23	10.8
105-67-9	2,4-Dimethylphenol	U	3.23	ug/L	3.23	10.8
51-28-5	2,4-Dinitrophenol	U	5.38	ug/L	5.38	21.5
121-14-2	2,4-Dinitrotoluene	U	3.23	ug/L	3.23	10.8
606-20-2	2,6-Dinitrotoluene	U	3.23	ug/L	3.23	10.8
91-58-7	2-Chloronaphthalene	U	0.441	ug/L	0.441	1.08
95-57-8	2-Chlorophenol	U	3.23	ug/L	3.23	10.8
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.23	ug/L	3.23	10.8
91-57-6	2-Methylnaphthalene	U	0.323	ug/L	0.323	1.08
88-75-5	2-Nitrophenol	U	3.23	ug/L	3.23	10.8
91-94-1	3,3'-Dichlorobenzidine	U	3.23	ug/L	3.23	10.8
101-55-3	4-Bromophenylphenylether	U	3.23	ug/L	3.23	10.8
59-50-7	Parachlorometa cresol	U	3.23	ug/L	3.23	10.8
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.55	ug/L	3.55	10.8
7005-72-3	4-Chlorophenylphenylether	U	3.23	ug/L	3.23	10.8
100-02-7	4-Nitrophenol	U	3.23	ug/L	3.23	10.8
83-32-9	Acenaphthene	U	0.323	ug/L	0.323	1.08
208-96-8	Acenaphthylene	U	0.323	ug/L	0.323	1.08
62-53-3	Aniline	U	4.52	ug/L	4.52	10.8
120-12-7	Anthracene	U	0.323	ug/L	0.323	1.08
1912-24-9	Atrazine	U	3.23	ug/L	3.23	10.8
92-87-5	Benzidine	U	4.19	ug/L	4.19	10.8
56-55-3	Benzo(a)anthracene	U	0.323	ug/L	0.323	1.08
50-32-8	Benzo(a)pyrene	U	0.323	ug/L	0.323	1.08
205-99-2	Benzo(b)fluoranthene	U	0.323	ug/L	0.323	1.08
191-24-2	Benzo(ghi)perylene	U	0.323	ug/L	0.323	1.08

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

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SDG Number: 2018-1038

Lab Sample ID: 438505004

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 18:24

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 930 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2821.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.323	ug/L	0.323	1.08
65-85-0	Benzoic acid	U	6.45	ug/L	6.45	21.5
100-51-6	Benzyl alcohol	U	3.23	ug/L	3.23	10.8
85-68-7	Butylbenzylphthalate	U	3.23	ug/L	3.23	10.8
218-01-9	Chrysene	U	0.323	ug/L	0.323	1.08
84-74-2	Di-n-butylphthalate	U	3.23	ug/L	3.23	10.8
117-84-0	Di-n-octylphthalate	U	3.23	ug/L	3.23	10.8
53-70-3	Dibenzo(a,h)anthracene	U	0.323	ug/L	0.323	1.08
132-64-9	Dibenzofuran	U	3.23	ug/L	3.23	10.8
84-66-2	Diethylphthalate	U	3.23	ug/L	3.23	10.8
131-11-3	Dimethylphthalate	U	3.23	ug/L	3.23	10.8
88-85-7	Dinoseb	U	3.23	ug/L	3.23	10.8
122-39-4	Diphenylamine	U	3.23	ug/L	3.23	10.8
206-44-0	Fluoranthene	U	0.323	ug/L	0.323	1.08
86-73-7	Fluorene	U	0.323	ug/L	0.323	1.08
118-74-1	Hexachlorobenzene	U	3.23	ug/L	3.23	10.8
87-68-3	Hexachlorobutadiene	U	3.23	ug/L	3.23	10.8
77-47-4	Hexachlorocyclopentadiene	U	3.23	ug/L	3.23	10.8
67-72-1	Hexachloroethane	U	3.23	ug/L	3.23	10.8
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.323	ug/L	0.323	1.08
78-59-1	Isophorone	U	3.76	ug/L	3.76	10.8
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.23	ug/L	3.23	10.8
924-16-3	N-Nitrosodi-n-butylamine	U	3.23	ug/L	3.23	10.8
55-18-5	N-Nitrosodiethylamine	U	3.23	ug/L	3.23	10.8
621-64-7	N-Nitrosodi-n-propylamine	U	3.23	ug/L	3.23	10.8
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.23	ug/L	3.23	10.8
91-20-3	Naphthalene	U	0.323	ug/L	0.323	1.08
98-95-3	Nitrobenzene	U	3.23	ug/L	3.23	10.8
608-93-5	Pentachlorobenzene	U	3.23	ug/L	3.23	10.8
87-86-5	Pentachlorophenol	U	3.23	ug/L	3.23	10.8
85-01-8	Phenanthrene	U	0.323	ug/L	0.323	1.08
108-95-2	Phenol	U	3.23	ug/L	3.23	10.8
129-00-0	Pyrene	U	0.323	ug/L	0.323	1.08
110-86-1	Pyridine	U	3.23	ug/L	3.23	10.8
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.23	ug/L	3.23	10.8
111-91-1	bis(2-Chloroethoxy)methane	U	3.23	ug/L	3.23	10.8
111-44-4	bis(2-Chloroethyl) ether	U	3.23	ug/L	3.23	10.8
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.23	ug/L	3.23	10.8

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

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SDG Number: 2018-1038

Lab Sample ID: 438505004

Date Collected: 11/20/2017 10:50

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1721502

Inst: MSD4.I

Dilution: 1

Run Date: 11/28/2017 18:24

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 930 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2821.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.98	ug/L	3.98	10.8
99-09-2	3-Nitroaniline	U	3.23	ug/L	3.23	10.8
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.23	ug/L	3.23	10.8
88-74-4	2-Nitroaniline	U	3.23	ug/L	3.23	10.8
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.23	ug/L	3.23	10.8
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	73.0	108	ug/L	68	(32%-124%)
2-Fluorobiphenyl	30.9	53.8	ug/L	57	(32%-112%)
2-Fluorophenol	41.8	108	ug/L	39	(15%-88%)
Nitrobenzene-d5	32.5	53.8	ug/L	60	(36%-115%)
Phenol-d5	26.3	108	ug/L	24	(15%-91%)
p-Terphenyl-d14	33.2	53.8	ug/L	62	(36%-121%)

Tentatively Identified Compound Summary

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

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

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505006

Date Collected: 11/20/2017 12:39

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148078

Batch ID: 1721502

Run Date: 11/28/2017 18:52

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2822.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 940 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.19	ug/L	3.19	10.6
120-82-1	1,2,4-Trichlorobenzene	U	3.19	ug/L	3.19	10.6
95-50-1	1,2-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
122-66-7	Azobenzene	U	3.19	ug/L	3.19	10.6
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
106-46-7	1,4-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
123-91-1	1,4-Dioxane	U	3.19	ug/L	3.19	10.6
90-12-0	1-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.19	ug/L	3.19	10.6
95-95-4	2,4,5-Trichlorophenol	U	3.19	ug/L	3.19	10.6
88-06-2	2,4,6-Trichlorophenol	U	3.19	ug/L	3.19	10.6
120-83-2	2,4-Dichlorophenol	U	3.19	ug/L	3.19	10.6
105-67-9	2,4-Dimethylphenol	U	3.19	ug/L	3.19	10.6
51-28-5	2,4-Dinitrophenol	U	5.32	ug/L	5.32	21.3
121-14-2	2,4-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
606-20-2	2,6-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
91-58-7	2-Chloronaphthalene	U	0.436	ug/L	0.436	1.06
95-57-8	2-Chlorophenol	U	3.19	ug/L	3.19	10.6
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.19	ug/L	3.19	10.6
91-57-6	2-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
88-75-5	2-Nitrophenol	U	3.19	ug/L	3.19	10.6
91-94-1	3,3'-Dichlorobenzidine	U	3.19	ug/L	3.19	10.6
101-55-3	4-Bromophenylphenylether	U	3.19	ug/L	3.19	10.6
59-50-7	Parachlorometa cresol	U	3.19	ug/L	3.19	10.6
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.51	ug/L	3.51	10.6
7005-72-3	4-Chlorophenylphenylether	U	3.19	ug/L	3.19	10.6
100-02-7	4-Nitrophenol	U	3.19	ug/L	3.19	10.6
83-32-9	Acenaphthene	U	0.319	ug/L	0.319	1.06
208-96-8	Acenaphthylene	U	0.319	ug/L	0.319	1.06
62-53-3	Aniline	U	4.47	ug/L	4.47	10.6
120-12-7	Anthracene	U	0.319	ug/L	0.319	1.06
1912-24-9	Atrazine	U	3.19	ug/L	3.19	10.6
92-87-5	Benzidine	U	4.15	ug/L	4.15	10.6
56-55-3	Benzo(a)anthracene	U	0.319	ug/L	0.319	1.06
50-32-8	Benzo(a)pyrene	U	0.319	ug/L	0.319	1.06
205-99-2	Benzo(b)fluoranthene	U	0.319	ug/L	0.319	1.06
191-24-2	Benzo(ghi)perylene	U	0.319	ug/L	0.319	1.06

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

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SDG Number: 2018-1038
Lab Sample ID: 438505006

Client ID: CAMO-18-148078
Batch ID: 1721502
Run Date: 11/28/2017 18:52
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2822.D

Date Collected: 11/20/2017 12:39
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 940 mL
Column: DB-5ms

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.319	ug/L	0.319	1.06
65-85-0	Benzoic acid	U	6.38	ug/L	6.38	21.3
100-51-6	Benzyl alcohol	U	3.19	ug/L	3.19	10.6
85-68-7	Butylbenzylphthalate	U	3.19	ug/L	3.19	10.6
218-01-9	Chrysene	U	0.319	ug/L	0.319	1.06
84-74-2	Di-n-butylphthalate	U	3.19	ug/L	3.19	10.6
117-84-0	Di-n-octylphthalate	U	3.19	ug/L	3.19	10.6
53-70-3	Dibenzo(a,h)anthracene	U	0.319	ug/L	0.319	1.06
132-64-9	Dibenzofuran	U	3.19	ug/L	3.19	10.6
84-66-2	Diethylphthalate	U	3.19	ug/L	3.19	10.6
131-11-3	Dimethylphthalate	U	3.19	ug/L	3.19	10.6
88-85-7	Dinoseb	U	3.19	ug/L	3.19	10.6
122-39-4	Diphenylamine	U	3.19	ug/L	3.19	10.6
206-44-0	Fluoranthene	U	0.319	ug/L	0.319	1.06
86-73-7	Fluorene	U	0.319	ug/L	0.319	1.06
118-74-1	Hexachlorobenzene	U	3.19	ug/L	3.19	10.6
87-68-3	Hexachlorobutadiene	U	3.19	ug/L	3.19	10.6
77-47-4	Hexachlorocyclopentadiene	U	3.19	ug/L	3.19	10.6
67-72-1	Hexachloroethane	U	3.19	ug/L	3.19	10.6
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.319	ug/L	0.319	1.06
78-59-1	Isophorone	U	3.72	ug/L	3.72	10.6
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.19	ug/L	3.19	10.6
924-16-3	N-Nitrosodi-n-butylamine	U	3.19	ug/L	3.19	10.6
55-18-5	N-Nitrosodiethylamine	U	3.19	ug/L	3.19	10.6
621-64-7	N-Nitrosodi-n-propylamine	U	3.19	ug/L	3.19	10.6
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.19	ug/L	3.19	10.6
91-20-3	Naphthalene	U	0.319	ug/L	0.319	1.06
98-95-3	Nitrobenzene	U	3.19	ug/L	3.19	10.6
608-93-5	Pentachlorobenzene	U	3.19	ug/L	3.19	10.6
87-86-5	Pentachlorophenol	U	3.19	ug/L	3.19	10.6
85-01-8	Phenanthrene	U	0.319	ug/L	0.319	1.06
108-95-2	Phenol	U	3.19	ug/L	3.19	10.6
129-00-0	Pyrene	U	0.319	ug/L	0.319	1.06
110-86-1	Pyridine	U	3.19	ug/L	3.19	10.6
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.19	ug/L	3.19	10.6
111-91-1	bis(2-Chloroethoxy)methane	U	3.19	ug/L	3.19	10.6
111-44-4	bis(2-Chloroethyl) ether	U	3.19	ug/L	3.19	10.6
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.19	ug/L	3.19	10.6

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

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SDG Number: 2018-1038
Lab Sample ID: 438505006

Client ID: CAMO-18-148078
Batch ID: 1721502
Run Date: 11/28/2017 18:52
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2822.D

Date Collected: 11/20/2017 12:39
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 940 mL
Column: DB-5ms

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.94	ug/L	3.94	10.6
99-09-2	3-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	3.19	ug/L	3.19	10.6
88-74-4	2-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	73.5	106	ug/L	69	(32%-124%)
2-Fluorobiphenyl	33.5	53.2	ug/L	63	(32%-112%)
2-Fluorophenol	44.9	106	ug/L	42	(15%-88%)
Nitrobenzene-d5	34.7	53.2	ug/L	65	(36%-115%)
Phenol-d5	28.1	106	ug/L	26	(15%-91%)
p-Terphenyl-d14	33.4	53.2	ug/L	63	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.008	5.39	ug/L	99	NJ

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

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SDG Number: 2018-1038

Lab Sample ID: 438505008

Date Collected: 11/20/2017 11:01

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 19:21

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2823.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.09	ug/L	3.09	10.3
120-82-1	1,2,4-Trichlorobenzene	U	3.09	ug/L	3.09	10.3
95-50-1	1,2-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
122-66-7	Azobenzene	U	3.09	ug/L	3.09	10.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
106-46-7	1,4-Dichlorobenzene	U	3.09	ug/L	3.09	10.3
123-91-1	1,4-Dioxane	U	3.09	ug/L	3.09	10.3
90-12-0	1-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.09	ug/L	3.09	10.3
95-95-4	2,4,5-Trichlorophenol	U	3.09	ug/L	3.09	10.3
88-06-2	2,4,6-Trichlorophenol	U	3.09	ug/L	3.09	10.3
120-83-2	2,4-Dichlorophenol	U	3.09	ug/L	3.09	10.3
105-67-9	2,4-Dimethylphenol	U	3.09	ug/L	3.09	10.3
51-28-5	2,4-Dinitrophenol	U	5.15	ug/L	5.15	20.6
121-14-2	2,4-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
606-20-2	2,6-Dinitrotoluene	U	3.09	ug/L	3.09	10.3
91-58-7	2-Chloronaphthalene	U	0.423	ug/L	0.423	1.03
95-57-8	2-Chlorophenol	U	3.09	ug/L	3.09	10.3
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.09	ug/L	3.09	10.3
91-57-6	2-Methylnaphthalene	U	0.309	ug/L	0.309	1.03
88-75-5	2-Nitrophenol	U	3.09	ug/L	3.09	10.3
91-94-1	3,3'-Dichlorobenzidine	U	3.09	ug/L	3.09	10.3
101-55-3	4-Bromophenylphenylether	U	3.09	ug/L	3.09	10.3
59-50-7	Parachlorometa cresol	U	3.09	ug/L	3.09	10.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.40	ug/L	3.40	10.3
7005-72-3	4-Chlorophenylphenylether	U	3.09	ug/L	3.09	10.3
100-02-7	4-Nitrophenol	U	3.09	ug/L	3.09	10.3
83-32-9	Acenaphthene	U	0.309	ug/L	0.309	1.03
208-96-8	Acenaphthylene	U	0.309	ug/L	0.309	1.03
62-53-3	Aniline	U	4.33	ug/L	4.33	10.3
120-12-7	Anthracene	U	0.309	ug/L	0.309	1.03
1912-24-9	Atrazine	U	3.09	ug/L	3.09	10.3
92-87-5	Benzidine	U	4.02	ug/L	4.02	10.3
56-55-3	Benzo(a)anthracene	U	0.309	ug/L	0.309	1.03
50-32-8	Benzo(a)pyrene	U	0.309	ug/L	0.309	1.03
205-99-2	Benzo(b)fluoranthene	U	0.309	ug/L	0.309	1.03
191-24-2	Benzo(ghi)perylene	U	0.309	ug/L	0.309	1.03

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

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SDG Number: 2018-1038

Lab Sample ID: 438505008

Date Collected: 11/20/2017 11:01

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 19:21

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 970 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2823.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.309	ug/L	0.309	1.03
65-85-0	Benzoic acid	U	6.19	ug/L	6.19	20.6
100-51-6	Benzyl alcohol	U	3.09	ug/L	3.09	10.3
85-68-7	Butylbenzylphthalate	U	3.09	ug/L	3.09	10.3
218-01-9	Chrysene	U	0.309	ug/L	0.309	1.03
84-74-2	Di-n-butylphthalate	U	3.09	ug/L	3.09	10.3
117-84-0	Di-n-octylphthalate	U	3.09	ug/L	3.09	10.3
53-70-3	Dibenzo(a,h)anthracene	U	0.309	ug/L	0.309	1.03
132-64-9	Dibenzofuran	U	3.09	ug/L	3.09	10.3
84-66-2	Diethylphthalate	U	3.09	ug/L	3.09	10.3
131-11-3	Dimethylphthalate	U	3.09	ug/L	3.09	10.3
88-85-7	Dinoseb	U	3.09	ug/L	3.09	10.3
122-39-4	Diphenylamine	U	3.09	ug/L	3.09	10.3
206-44-0	Fluoranthene	U	0.309	ug/L	0.309	1.03
86-73-7	Fluorene	U	0.309	ug/L	0.309	1.03
118-74-1	Hexachlorobenzene	U	3.09	ug/L	3.09	10.3
87-68-3	Hexachlorobutadiene	U	3.09	ug/L	3.09	10.3
77-47-4	Hexachlorocyclopentadiene	U	3.09	ug/L	3.09	10.3
67-72-1	Hexachloroethane	U	3.09	ug/L	3.09	10.3
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.309	ug/L	0.309	1.03
78-59-1	Isophorone	U	3.61	ug/L	3.61	10.3
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.09	ug/L	3.09	10.3
924-16-3	N-Nitrosodi-n-butylamine	U	3.09	ug/L	3.09	10.3
55-18-5	N-Nitrosodiethylamine	U	3.09	ug/L	3.09	10.3
621-64-7	N-Nitrosodi-n-propylamine	U	3.09	ug/L	3.09	10.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.09	ug/L	3.09	10.3
91-20-3	Naphthalene	U	0.309	ug/L	0.309	1.03
98-95-3	Nitrobenzene	U	3.09	ug/L	3.09	10.3
608-93-5	Pentachlorobenzene	U	3.09	ug/L	3.09	10.3
87-86-5	Pentachlorophenol	U	3.09	ug/L	3.09	10.3
85-01-8	Phenanthrene	U	0.309	ug/L	0.309	1.03
108-95-2	Phenol	U	3.09	ug/L	3.09	10.3
129-00-0	Pyrene	U	0.309	ug/L	0.309	1.03
110-86-1	Pyridine	U	3.09	ug/L	3.09	10.3
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.09	ug/L	3.09	10.3
111-91-1	bis(2-Chloroethoxy)methane	U	3.09	ug/L	3.09	10.3
111-44-4	bis(2-Chloroethyl) ether	U	3.09	ug/L	3.09	10.3
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.09	ug/L	3.09	10.3

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

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SDG Number: 2018-1038
Lab Sample ID: 438505008

Client ID: CAMO-18-148079
Batch ID: 1721502
Run Date: 11/28/2017 19:21
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2823.D

Date Collected: 11/20/2017 11:01
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 970 mL
Column: DB-5ms

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.81	ug/L	3.81	10.3
99-09-2	3-Nitroaniline	U	3.09	ug/L	3.09	10.3
95-48-7	<i>m</i> -Nitroaniline o-Cresol	U	3.09	ug/L	3.09	10.3
88-74-4	2-Nitroaniline	U	3.09	ug/L	3.09	10.3
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.09	ug/L	3.09	10.3

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	63.3	103	ug/L	61 (32%-124%)
2-Fluorobiphenyl	27.4	51.5	ug/L	53 (32%-112%)
2-Fluorophenol	35.1	103	ug/L	34 (15%-88%)
Nitrobenzene-d5	28.2	51.5	ug/L	55 (36%-115%)
Phenol-d5	22.0	103	ug/L	21 (15%-91%)
p-Terphenyl-d14	29.5	51.5	ug/L	57 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	Unknown Aldol Condensate	3.366	14.8	ug/L		AJ

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

Page 1 of 3

SDG Number: 2018-1038

Lab Sample ID: 438505011

Date Collected: 11/20/2017 13:03

Date Received: 11/22/2017 08:55

Matrix: W

Client ID: CAMO-18-148080

Batch ID: 1721502

Run Date: 11/28/2017 19:49

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2824.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 940 mL

Column: DB-5ms

Project: ESHL00114

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.19	ug/L	3.19	10.6
120-82-1	1,2,4-Trichlorobenzene	U	3.19	ug/L	3.19	10.6
95-50-1	1,2-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
122-66-7	Azobenzene	U	3.19	ug/L	3.19	10.6
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
106-46-7	1,4-Dichlorobenzene	U	3.19	ug/L	3.19	10.6
123-91-1	1,4-Dioxane	U	3.19	ug/L	3.19	10.6
90-12-0	1-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.19	ug/L	3.19	10.6
95-95-4	2,4,5-Trichlorophenol	U	3.19	ug/L	3.19	10.6
88-06-2	2,4,6-Trichlorophenol	U	3.19	ug/L	3.19	10.6
120-83-2	2,4-Dichlorophenol	U	3.19	ug/L	3.19	10.6
105-67-9	2,4-Dimethylphenol	U	3.19	ug/L	3.19	10.6
51-28-5	2,4-Dinitrophenol	U	5.32	ug/L	5.32	21.3
121-14-2	2,4-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
606-20-2	2,6-Dinitrotoluene	U	3.19	ug/L	3.19	10.6
91-58-7	2-Chloronaphthalene	U	0.436	ug/L	0.436	1.06
95-57-8	2-Chlorophenol	U	3.19	ug/L	3.19	10.6
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.19	ug/L	3.19	10.6
91-57-6	2-Methylnaphthalene	U	0.319	ug/L	0.319	1.06
88-75-5	2-Nitrophenol	U	3.19	ug/L	3.19	10.6
91-94-1	3,3'-Dichlorobenzidine	U	3.19	ug/L	3.19	10.6
101-55-3	4-Bromophenylphenylether	U	3.19	ug/L	3.19	10.6
59-50-7	Parachlorometa cresol	U	3.19	ug/L	3.19	10.6
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.51	ug/L	3.51	10.6
7005-72-3	4-Chlorophenylphenylether	U	3.19	ug/L	3.19	10.6
100-02-7	4-Nitrophenol	U	3.19	ug/L	3.19	10.6
83-32-9	Acenaphthene	U	0.319	ug/L	0.319	1.06
208-96-8	Acenaphthylene	U	0.319	ug/L	0.319	1.06
62-53-3	Aniline	U	4.47	ug/L	4.47	10.6
120-12-7	Anthracene	U	0.319	ug/L	0.319	1.06
1912-24-9	Atrazine	U	3.19	ug/L	3.19	10.6
92-87-5	Benzidine	U	4.15	ug/L	4.15	10.6
56-55-3	Benzo(a)anthracene	U	0.319	ug/L	0.319	1.06
50-32-8	Benzo(a)pyrene	U	0.319	ug/L	0.319	1.06
205-99-2	Benzo(b)fluoranthene	U	0.319	ug/L	0.319	1.06
191-24-2	Benzo(ghi)perylene	U	0.319	ug/L	0.319	1.06

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

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SDG Number: 2018-1038

Lab Sample ID: 438505011

Date Collected: 11/20/2017 13:03

Date Received: 11/22/2017 08:55

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD4.I

Dilution: 1

Batch ID: 1721502

Run Date: 11/28/2017 19:49

Analyst: JMB3

Inj. Vol: 1 uL

Prep Date: 11/27/2017 05:00

Aliquot: 940 mL

Final Volume: 1 mL

Data File: s112817.B\s4k2824.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.319	ug/L	0.319	1.06
65-85-0	Benzoic acid	U	6.38	ug/L	6.38	21.3
100-51-6	Benzyl alcohol	U	3.19	ug/L	3.19	10.6
85-68-7	Butylbenzylphthalate	U	3.19	ug/L	3.19	10.6
218-01-9	Chrysene	U	0.319	ug/L	0.319	1.06
84-74-2	Di-n-butylphthalate	U	3.19	ug/L	3.19	10.6
117-84-0	Di-n-octylphthalate	U	3.19	ug/L	3.19	10.6
53-70-3	Dibenzo(a,h)anthracene	U	0.319	ug/L	0.319	1.06
132-64-9	Dibenzofuran	U	3.19	ug/L	3.19	10.6
84-66-2	Diethylphthalate	U	3.19	ug/L	3.19	10.6
131-11-3	Dimethylphthalate	U	3.19	ug/L	3.19	10.6
88-85-7	Dinoseb	U	3.19	ug/L	3.19	10.6
122-39-4	Diphenylamine	U	3.19	ug/L	3.19	10.6
206-44-0	Fluoranthene	U	0.319	ug/L	0.319	1.06
86-73-7	Fluorene	U	0.319	ug/L	0.319	1.06
118-74-1	Hexachlorobenzene	U	3.19	ug/L	3.19	10.6
87-68-3	Hexachlorobutadiene	U	3.19	ug/L	3.19	10.6
77-47-4	Hexachlorocyclopentadiene	U	3.19	ug/L	3.19	10.6
67-72-1	Hexachloroethane	U	3.19	ug/L	3.19	10.6
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.319	ug/L	0.319	1.06
78-59-1	Isophorone	U	3.72	ug/L	3.72	10.6
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.19	ug/L	3.19	10.6
924-16-3	N-Nitrosodi-n-butylamine	U	3.19	ug/L	3.19	10.6
55-18-5	N-Nitrosodiethylamine	U	3.19	ug/L	3.19	10.6
621-64-7	N-Nitrosodi-n-propylamine	U	3.19	ug/L	3.19	10.6
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.19	ug/L	3.19	10.6
91-20-3	Naphthalene	U	0.319	ug/L	0.319	1.06
98-95-3	Nitrobenzene	U	3.19	ug/L	3.19	10.6
608-93-5	Pentachlorobenzene	U	3.19	ug/L	3.19	10.6
87-86-5	Pentachlorophenol	U	3.19	ug/L	3.19	10.6
85-01-8	Phenanthrene	U	0.319	ug/L	0.319	1.06
108-95-2	Phenol	U	3.19	ug/L	3.19	10.6
129-00-0	Pyrene	U	0.319	ug/L	0.319	1.06
110-86-1	Pyridine	U	3.19	ug/L	3.19	10.6
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.19	ug/L	3.19	10.6
111-91-1	bis(2-Chloroethoxy)methane	U	3.19	ug/L	3.19	10.6
111-44-4	bis(2-Chloroethyl) ether	U	3.19	ug/L	3.19	10.6
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.19	ug/L	3.19	10.6

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

Page 3 of 3

SDG Number: 2018-1038
Lab Sample ID: 438505011

Client ID: CAMO-18-148080
Batch ID: 1721502
Run Date: 11/28/2017 19:49
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2824.D

Date Collected: 11/20/2017 13:03
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 940 mL
Column: DB-5ms

Matrix: W

Project: ESHL00114
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.94	ug/L	3.94	10.6
99-09-2	3-Nitroaniline	U	3.19	ug/L	3.19	10.6
95-48-7	<i>m</i> -Nitroaniline o-Cresol	U	3.19	ug/L	3.19	10.6
88-74-4	2-Nitroaniline	U	3.19	ug/L	3.19	10.6
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.19	ug/L	3.19	10.6

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	64.4	106	ug/L	61	(32%-124%)
2-Fluorobiphenyl	32.6	53.2	ug/L	61	(32%-112%)
2-Fluorophenol	36.6	106	ug/L	34	(15%-88%)
Nitrobenzene-d5	31.9	53.2	ug/L	60	(36%-115%)
Phenol-d5	24.3	106	ug/L	23	(15%-91%)
p-Terphenyl-d14	30.0	53.2	ug/L	56	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	2.008	5.72	ug/L	99	NJ

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-1038

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203926420	MB for batch 1721501	39	24	61	57	63	66
1203926421	LCS for batch 1721501	41	25	65	61	71	63
438505002	CAMO-18-148077	38	24	60	59	65	65
1203926422	CAMO-18-148077MS	55	41	62	62	72	60
1203926423	CAMO-18-148077MSD	69	52	82	80	88	72
438505004	CAMO-18-148112	39	24	60	57	68	62
438505006	CAMO-18-148078	42	26	65	63	69	63
438505008	CAMO-18-148079	34	21	55	53	61	57
438505011	CAMO-18-148080	34	23	60	61	61	56

Surrogate

Acceptance Limits

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

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1721501

Matrix: WATER

Lab Sample ID 1203926421

Instrument: MSD4.I

Analysis Date: 11/28/2017 12:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylamine	50.0	0.0	19.8	40	30-88
110-86-1	LCS Pyridine	50.0	0.0	16.6	33	27-89
62-53-3	LCS Aniline	50.0	0.0	32.1	64	49-112
108-95-2	LCS Phenol	50.0	0.0	13.2	26	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	35.7	71	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	33.0	66	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	22.4	45	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	22.8	46	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	24.1	48	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	33.7	67	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	29.6	59	44-102
95-48-7	LCS o-Cresol	50.0	0.0	29.6	59	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	30.0	60	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	36.3	73	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	20.6	41	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	33.7	67	53-115
78-59-1	LCS Isophorone	50.0	0.0	35.1	70	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	36.5	73	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	29.9	60	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	36.6	73	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	37.3	75	53-109
65-85-0	LCS Benzoic acid	100	0.0	29.5	30	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1721501

Matrix: WATER

Lab Sample ID 1203926421

Instrument: MSD4.I

Analysis Date: 11/28/2017 12:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	LCS 4-Chloroaniline	50.0	0.0	47.1	94	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	21.5	43	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	37.3	75	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	27.7	55	42-103
91-20-3	LCS Naphthalene	50.0	0.0	25.9	52	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	28.9	58	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	17.0	34	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	34.8	70	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	36.1	72	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	29.4	59	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	35.4	71	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	47.8	96	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	38.2	76	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	38.0	76	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	39.4	79	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	32.9	66	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	35.1	70	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	32.9	66	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	34.4	69	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	35.9	72	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	38.1	76	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	13.1	26	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1721501

Matrix: WATER

Lab Sample ID 1203926421

Instrument: MSD4.I

Analysis Date: 11/28/2017 12:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	LCS Fluorene	50.0	0.0	35.0	70	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	37.2	74	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	47.7	95	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	40.6	81	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	34.7	69	55-113
122-66-7	LCS Azobenzene	50.0	0.0	32.9	66	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	35.5	71	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	35.3	71	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	40.4	81	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	36.2	72	55-110
120-12-7	LCS Anthracene	50.0	0.0	36.8	74	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	38.8	78	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	42.3	85	54-118
129-00-0	LCS Pyrene	50.0	0.0	29.0	58	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	32.0	64	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	33.3	67	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	37.6	75	57-112
218-01-9	LCS Chrysene	50.0	0.0	38.1	76	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	35.4	71	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	38.0	76	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	39.4	79	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	37.0	74	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-1038

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1721501

Matrix: WATER

Lab Sample ID 1203926421

Instrument: MSD4.I

Analysis Date: 11/28/2017 12:41

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	LCS Indeno(1,2,3-cd)pyrene	50.0	0.0	33.0	66	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	34.0	68	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	31.1	62	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	21.3	43	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	35.8	72	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	28.6	57	44-102
1912-24-9	LCS Atrazine	50.0	0.0	41.2	82	60-131
92-87-5	LCS Benzidine	100	0.0	60.4	60	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	44.4	89	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	24.5	49	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-1038

Sample Type: Matrix Spike

Client ID: CAMO-18-148077MS

Matrix: W

Lab Sample ID 1203926422

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:27

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylamine	116	0.00 U	59.7	51	25-106
110-86-1	MS Pyridine	116	0.00 U	36.5	31	24-93
62-53-3	MS Aniline	116	0.00 U	70.7	61	37-113
108-95-2	MS Phenol	116	0.00 U	47.6	41	23-82
111-44-4	MS bis(2-Chloroethyl) ether	116	0.00 U	76.6	66	39-114
95-57-8	MS 2-Chlorophenol	116	0.00 U	72.4	62	37-108
541-73-1	MS 1,3-Dichlorobenzene	116	0.00 U	59.2	51	27-97
106-46-7	MS 1,4-Dichlorobenzene	116	0.00 U	59.4	51	28-97
95-50-1	MS 1,2-Dichlorobenzene	116	0.00 U	61.0	52	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)ether	116	0.00 U	74.2	64	32-127
100-51-6	MS Benzyl alcohol	116	0.00 U	73.2	63	37-116
95-48-7	MS o-Cresol	116	0.00 U	71.2	61	34-109
65794-96-9	MS m,p-Cresols	116	0.00 U	76.7	66	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00 U	77.7	67	42-118
67-72-1	MS Hexachloroethane	116	0.00 U	56.8	49	29-94
98-95-3	MS Nitrobenzene	116	0.00 U	72.7	63	38-123
78-59-1	MS Isophorone	116	0.00 U	73.9	64	43-120
88-75-5	MS 2-Nitrophenol	116	0.00 U	80.2	69	39-115
105-67-9	MS 2,4-Dimethylphenol	116	0.00 U	62.6	54	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	116	0.00 U	77.5	67	42-118
120-83-2	MS 2,4-Dichlorophenol	116	0.00 U	79.9	69	40-111
65-85-0	MS Benzoic acid	233	0.00 U	120	52	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-1038

Client ID: CAMO-18-148077MS

Lab Sample ID 1203926422

Instrument: MSD4.I

Analyst: JMB3

Inj. Vol: 1 uL

Sample Type: Matrix Spike

Matrix: W

Analysis Date: 11/28/2017 17:27

Dilution: 1

Prep Batch ID: 1721501

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS 4-Chloroaniline	116	0.00 U	101	87	44-138
87-68-3	MS Hexachlorobutadiene	116	0.00 U	57.8	50	26-98
59-50-7	MS Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00 U	79.5	68	41-122
91-57-6	MS 2-Methylnaphthalene	116	0.00 U	61.7	53	29-109
91-20-3	MS Naphthalene	116	0.00 U	62.5	54	31-108
90-12-0	MS 1-Methylnaphthalene	116	0.00 U	64.2	55	33-112
77-47-4	MS Hexachlorocyclopentadiene	116	0.00 U	39.8	34	26-79
88-06-2	MS 2,4,6-Trichlorophenol	116	0.00 U	76.5	66	39-124
95-95-4	MS 2,4,5-Trichlorophenol	116	0.00 U	80.4	69	42-120
91-58-7	MS 2-Chloronaphthalene	116	0.00 U	63.6	55	29-113
88-74-4	MS 2-Nitroaniline o-Nitroaniline	116	0.00 U	75.7	65	41-121
99-09-2	MS 3-Nitroaniline m-Nitroaniline	116	0.00 U	104	90	42-144
131-11-3	MS Dimethylphthalate	116	0.00 U	83.1	71	45-128
606-20-2	MS 2,6-Dinitrotoluene	116	0.00 U	81.9	70	46-124
121-14-2	MS 2,4-Dinitrotoluene	116	0.00 U	85.7	74	45-125
208-96-8	MS Acenaphthylene	116	0.00 U	70.3	60	35-120
83-32-9	MS Acenaphthene	116	0.00 U	75.0	65	35-117
51-28-5	MS 2,4-Dinitrophenol	116	0.00 U	73.4	63	27-122
132-64-9	MS Dibenzofuran	116	0.00 U	74.5	64	38-113
58-90-2	MS 2,3,4,6-Tetrachlorophenol	116	0.00 U	81.4	70	40-128
84-66-2	MS Diethylphthalate	116	0.00 U	83.1	71	43-127
100-02-7	MS 4-Nitrophenol	116	0.00 U	55.5	48	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2018-1038

Sample Type: Matrix Spike

Client ID: CAMO-18-148077MS

Matrix: W

Lab Sample ID 1203926422

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:27

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS Fluorene	116	0.00 U	75.3	65	39-117
7005-72-3	MS 4-Chlorophenylphenylether	116	0.00 U	80.2	69	39-121
100-01-6	MS 4-Nitroaniline	116	0.00 U	102	88	30-133
534-52-1	MS 2-Methyl-4,6-dinitrophenol	116	0.00 U	89.7	77	32-126
122-39-4	MS Diphenylamine	116	0.00 U	74.0	64	37-118
122-66-7	MS Azobenzene	116	0.00 U	68.9	59	38-120
101-55-3	MS 4-Bromophenylphenylether	116	0.00 U	77.9	67	39-121
118-74-1	MS Hexachlorobenzene	116	0.00 U	76.9	66	40-118
87-86-5	MS Pentachlorophenol	116	0.00 U	89.7	77	35-121
85-01-8	MS Phenanthrene	116	0.00 U	77.2	66	40-115
120-12-7	MS Anthracene	116	0.00 U	78.0	67	38-120
84-74-2	MS Di-n-butylphthalate	116	0.00 U	82.1	71	41-128
206-44-0	MS Fluoranthene	116	0.00 U	88.9	76	41-119
129-00-0	MS Pyrene	116	0.00 U	61.9	53	35-128
85-68-7	MS Butylbenzylphthalate	116	0.00 U	66.5	57	40-129
117-81-7	MS bis(2-Ethylhexyl)phthalate	116	0.00 U	69.0	59	38-131
56-55-3	MS Benzo(a)anthracene	116	0.00 U	78.7	68	39-120
218-01-9	MS Chrysene	116	0.00 U	80.2	69	41-124
117-84-0	MS Di-n-octylphthalate	116	0.00 U	72.6	62	37-134
205-99-2	MS Benzo(b)fluoranthene	116	0.00 U	82.7	71	31-122
207-08-9	MS Benzo(k)fluoranthene	116	0.00 U	86.5	74	33-123
50-32-8	MS Benzo(a)pyrene	116	0.00 U	77.7	67	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Client ID: CAMO-18-148077MS

Lab Sample ID 1203926422

Instrument: MSD4.I

Analyst: JMB3

Inj. Vol: 1 uL

Sample Type: Matrix Spike

Matrix: W

Analysis Date: 11/28/2017 17:27

Dilution: 1

Prep Batch ID:1721501

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
193-39-5	MS Indeno(1,2,3-cd)pyrene	116	0.00 U	64.3	55	27-121
53-70-3	MS Dibenzo(a,h)anthracene	116	0.00 U	66.7	57	30-125
191-24-2	MS Benzo(ghi)perylene	116	0.00 U	60.3	52	24-126
123-91-1	MS 1,4-Dioxane	116	0.00 U	65.4	56	24-110
930-55-2	MS N-Nitrosopyrrolidine	116	0.00 U	81.1	70	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	116	0.00 U	62.9	54	32-101
1912-24-9	MS Atrazine	116	0.00 U	89.4	77	42-129
92-87-5	MS Benzidine	233	0.00 U	87.6	38	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	116	0.00 U	92.1	79	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	116	0.00 U	62.6	54	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-148077MSD

Matrix: W

Lab Sample ID 1203926423

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:55

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylamine	116	0.00	U 72.3	62	25-106	19	0-30
110-86-1	MSD Pyridine	116	0.00	U 46.7	40	24-93	25	0-30
62-53-3	MSD Aniline	116	0.00	U 83.3	72	37-113	16	0-30
108-95-2	MSD Phenol	116	0.00	U 59.3	51	23-82	22	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	116	0.00	U 98.9	85	39-114	25	0-30
95-57-8	MSD 2-Chlorophenol	116	0.00	U 93.8	81	37-108	26	0-30
541-73-1	MSD 1,3-Dichlorobenzene	116	0.00	U 78.6	68	27-97	28	0-30
106-46-7	MSD 1,4-Dichlorobenzene	116	0.00	U 78.3	67	28-97	28	0-30
95-50-1	MSD 1,2-Dichlorobenzene	116	0.00	U 81.1	70	28-99	28	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)ether	116	0.00	U 97.7	84	32-127	27	0-30
100-51-6	MSD Benzyl alcohol	116	0.00	U 91.7	79	37-116	22	0-30
95-48-7	MSD o-Cresol	116	0.00	U 92.9	80	34-109	26	0-30
65794-96-9	MSD m,p-Cresols	116	0.00	U 96.9	83	36-120	23	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00	U 102	88	42-118	27	0-30
67-72-1	MSD Hexachloroethane	116	0.00	U 75.6	65	29-94	28	0-30
98-95-3	MSD Nitrobenzene	116	0.00	U 94.6	81	38-123	26	0-30
78-59-1	MSD Isophorone	116	0.00	U 97.2	84	43-120	27	0-30
88-75-5	MSD 2-Nitrophenol	116	0.00	U 102	88	39-115	24	0-30
105-67-9	MSD 2,4-Dimethylphenol	116	0.00	U 79.8	69	39-107	24	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	116	0.00	U 102	88	42-118	27	0-30
120-83-2	MSD 2,4-Dichlorophenol	116	0.00	U 104	90	40-111	26	0-30
65-85-0	MSD Benzoic acid	233	0.00	U 140	60	17-95	15	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-148077MSD

Matrix: W

Lab Sample ID 1203926423

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:55

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	116	0.00 U	125	107	44-138	21	0-30
87-68-3	MSD Hexachlorobutadiene	116	0.00 U	80.4	69	26-98	33 *	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00 U	101	87	41-122	24	0-30
91-57-6	MSD 2-Methylnaphthalene	116	0.00 U	86.7	75	29-109	34 *	0-30
91-20-3	MSD Naphthalene	116	0.00 U	86.1	74	31-108	32 *	0-30
90-12-0	MSD 1-Methylnaphthalene	116	0.00 U	90.7	78	33-112	34 *	0-30
77-47-4	MSD Hexachlorocyclopentadiene	116	0.00 U	54.3	47	26-79	31 *	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	116	0.00 U	96.1	83	39-124	23	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	116	0.00 U	98.7	85	42-120	20	0-30
91-58-7	MSD 2-Chloronaphthalene	116	0.00 U	87.2	75	29-113	31 *	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	116	0.00 U	92.6	80	41-121	20	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	116	0.00 U	123	105	42-144	16	0-30
131-11-3	MSD Dimethylphthalate	116	0.00 U	102	88	45-128	20	0-30
606-20-2	MSD 2,6-Dinitrotoluene	116	0.00 U	101	87	46-124	21	0-30
121-14-2	MSD 2,4-Dinitrotoluene	116	0.00 U	104	89	45-125	19	0-30
208-96-8	MSD Acenaphthylene	116	0.00 U	92.0	79	35-120	27	0-30
83-32-9	MSD Acenaphthene	116	0.00 U	100	86	35-117	28	0-30
51-28-5	MSD 2,4-Dinitrophenol	116	0.00 U	83.4	72	27-122	13	0-30
132-64-9	MSD Dibenzofuran	116	0.00 U	95.6	82	38-113	25	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	116	0.00 U	98.7	85	40-128	19	0-30
84-66-2	MSD Diethylphthalate	116	0.00 U	103	89	43-127	22	0-30
100-02-7	MSD 4-Nitrophenol	116	0.00 U	69.7	60	17-85	23	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-148077MSD

Matrix: W

Lab Sample ID 1203926423

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:55

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	116	0.00 U	95.0	82	39-117	23	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	116	0.00 U	105	90	39-121	26	0-30
100-01-6	MSD 4-Nitroaniline <i>p</i> -Nitroaniline	116	0.00 U	122	105	30-133	17	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	116	0.00 U	106	91	32-126	16	0-30
122-39-4	MSD Diphenylamine	116	0.00 U	95.9	82	37-118	26	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00 U	90.8	78	38-120	27	0-30
101-55-3	MSD 4-Bromophenylphenylether	116	0.00 U	101	87	39-121	26	0-30
118-74-1	MSD Hexachlorobenzene	116	0.00 U	101	87	40-118	27	0-30
87-86-5	MSD Pentachlorophenol	116	0.00 U	107	92	35-121	18	0-30
85-01-8	MSD Phenanthrene	116	0.00 U	97.9	84	40-115	24	0-30
120-12-7	MSD Anthracene	116	0.00 U	100	86	38-120	25	0-30
84-74-2	MSD Di-n-butylphthalate	116	0.00 U	108	93	41-128	27	0-30
206-44-0	MSD Fluoranthene	116	0.00 U	115	99	41-119	26	0-30
129-00-0	MSD Pyrene	116	0.00 U	73.6	63	35-128	17	0-30
85-68-7	MSD Butylbenzylphthalate	116	0.00 U	81.4	70	40-129	20	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	116	0.00 U	86.5	74	38-131	23	0-30
56-55-3	MSD Benzo(a)anthracene	116	0.00 U	99.5	86	39-120	23	0-30
218-01-9	MSD Chrysene	116	0.00 U	103	88	41-124	25	0-30
117-84-0	MSD Di-n-octylphthalate	116	0.00 U	98.1	84	37-134	30	0-30
205-99-2	MSD Benzo(b)fluoranthene	116	0.00 U	98.2	84	31-122	17	0-30
207-08-9	MSD Benzo(k)fluoranthene	116	0.00 U	102	88	33-123	17	0-30
50-32-8	MSD Benzo(a)pyrene	116	0.00 U	97.9	84	32-118	23	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-1038

Sample Type: Matrix Spike Duplicate

Client ID: CAMO-18-148077MSD

Matrix: W

Lab Sample ID 1203926423

Instrument: MSD4.I

Analysis Date: 11/28/2017 17:55

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1721501

Inj. Vol: 1 uL

Batch ID: 1721502

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	Acceptance RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	116	0.00	U	94.5	81	27-121	38 * 0-30
53-70-3	MSD Dibenzo(a,h)anthracene	116	0.00	U	98.2	84	30-125	38 * 0-30
191-24-2	MSD Benzo(ghi)perylene	116	0.00	U	90.2	78	24-126	40 * 0-30
123-91-1	MSD 1,4-Dioxane	116	0.00	U	79.7	69	24-110	20 0-30
930-55-2	MSD N-Nitrosopyrrolidine	116	0.00	U	104	89	47-119	25 0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	116	0.00	U	86.7	75	32-101	32 * 0-30
1912-24-9	MSD Atrazine	116	0.00	U	116	100	42-129	26 0-30
92-87-5	MSD Benzidine	233	0.00	U	90.5	39	15-130	3 0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	116	0.00	U	122	105	34-124	28 0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	116	0.00	U	86.3	74	26-102	32 * 0-30

Method Blank Summary

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SDG Number:	2018-1038	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1721501	Instrument ID:	MSD4.I	Data File:	s112817.B\s4k2808.D
Lab Sample ID:	1203926420	Prep Date:	11/27/2017 05:00	Analyzed:	11/28/17 12:13
Column:	DB-5ms				

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1721501	1203926421	s112817.B\s4k2809.D	11/28/17	1241
02 CAMO-18-148077	438505002	s112817.B\s4k2818.D	11/28/17	1658
03 CAMO-18-148077MS	1203926422	s112817.B\s4k2819.D	11/28/17	1727
04 CAMO-18-148077MSD	1203926423	s112817.B\s4k2820.D	11/28/17	1755
05 CAMO-18-148112	438505004	s112817.B\s4k2821.D	11/28/17	1824
06 CAMO-18-148078	438505006	s112817.B\s4k2822.D	11/28/17	1852
07 CAMO-18-148079	438505008	s112817.B\s4k2823.D	11/28/17	1921
08 CAMO-18-148080	438505011	s112817.B\s4k2824.D	11/28/17	1949

Quality Control Data

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

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SDG Number: 2018-1038

Lab Sample ID: 1203926420

Client Sample: QC for batch 1721501

Client ID: MB for batch 1721501

Batch ID: 1721502

Run Date: 11/28/2017 12:13

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2808.D

Matrix: WATER

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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

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SDG Number: 2018-1038

Lab Sample ID: 1203926420

Client Sample: QC for batch 1721501

Client ID: MB for batch 1721501

Batch ID: 1721502

Run Date: 11/28/2017 12:13

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2808.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

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

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SDG Number: 2018-1038	Matrix: WATER
Lab Sample ID: 1203926420	
Client Sample: QC for batch 1721501	Client: ARSL004
Client ID: MB for batch 1721501	Method: SW846 3510C/8270D
Batch ID: 1721502	Inst: MSD4.I
Run Date: 11/28/2017 12:13	Analyst: JMB3
Prep Date: 11/27/2017 05:00	Aliquot: 1000 mL
Data File: s112817.B\s4k2808.D	Column: DB-5ms
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	63.5	100	ug/L	63	(32%-124%)
2-Fluorobiphenyl	28.7	50.0	ug/L	57	(32%-112%)
2-Fluorophenol	39.4	100	ug/L	39	(15%-88%)
Nitrobenzene-d5	30.7	50.0	ug/L	61	(36%-115%)
Phenol-d5	24.5	100	ug/L	24	(15%-91%)
p-Terphenyl-d14	32.9	50.0	ug/L	66	(36%-121%)

Tentatively Identified Compound Summary

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

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SDG Number: 2018-1038

Lab Sample ID: 1203926421

Client Sample: QC for batch 1721501

Client ID: LCS for batch 1721501

Batch ID: 1721502

Run Date: 11/28/2017 12:41

Prep Date: 11/27/2017 05:00

Data File: s112817.B\s4k2809.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		28.6	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		24.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		24.1	ug/L	3.00	10.0
122-66-7	Azobenzene		32.9	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		22.4	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		22.8	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		21.3	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		28.9	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		35.9	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		36.1	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		34.8	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		37.3	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		29.9	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		32.9	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		39.4	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		38.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		29.4	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		33.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		40.6	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		27.7	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		36.5	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		44.4	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		35.5	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		37.3	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		47.1	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		37.2	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		13.1	ug/L	3.00	10.0
83-32-9	Acenaphthene		35.1	ug/L	0.300	1.00
208-96-8	Acenaphthylene		32.9	ug/L	0.300	1.00
62-53-3	Aniline		32.1	ug/L	4.20	10.0
120-12-7	Anthracene		36.8	ug/L	0.300	1.00
1912-24-9	Atrazine		41.2	ug/L	3.00	10.0
92-87-5	Benzidine		60.4	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		37.6	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		37.0	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		38.0	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		31.1	ug/L	0.300	1.00

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SDG Number: 2018-1038
Lab Sample ID: 1203926421
Client Sample: QC for batch 1721501
Client ID: LCS for batch 1721501
Batch ID: 1721502
Run Date: 11/28/2017 12:41
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2809.D

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

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		39.4	ug/L	0.300	1.00
65-85-0	Benzoic acid		29.5	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		29.6	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		32.0	ug/L	3.00	10.0
218-01-9	Chrysene		38.1	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		38.8	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		35.4	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		34.0	ug/L	0.300	1.00
132-64-9	Dibenzofuran		34.4	ug/L	3.00	10.0
84-66-2	Diethylphthalate		38.1	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		38.2	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		34.7	ug/L	3.00	10.0
206-44-0	Fluoranthene		42.3	ug/L	0.300	1.00
86-73-7	Fluorene		35.0	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		35.3	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		21.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		17.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane		20.6	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		33.0	ug/L	0.300	1.00
78-59-1	Isophorone		35.1	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		19.8	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	3.00	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	3.00	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		36.3	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		35.8	ug/L	3.00	10.0
91-20-3	Naphthalene		25.9	ug/L	0.300	1.00
98-95-3	Nitrobenzene		33.7	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		40.4	ug/L	3.00	10.0
85-01-8	Phenanthrene		36.2	ug/L	0.300	1.00
108-95-2	Phenol		13.2	ug/L	3.00	10.0
129-00-0	Pyrene		29.0	ug/L	0.300	1.00
110-86-1	Pyridine		16.6	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		33.7	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		36.6	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		35.7	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		33.3	ug/L	3.00	10.0

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SDG Number: 2018-1038	Matrix: WATER
Lab Sample ID: 1203926421	
Client Sample: QC for batch 1721501	Client: ARSL004
Client ID: LCS for batch 1721501	Method: SW846 3510C/8270D
Batch ID: 1721502	Inst: MSD4.I
Run Date: 11/28/2017 12:41	Analyst: JMB3
Prep Date: 11/27/2017 05:00	Aliquot: 1000 mL
Data File: s112817.B\s4k2809.D	Column: DB-5ms
	Project: QC
	SOP Ref: GL-OA-E-009
	Dilution: 1
	Inj. Vol: 1 uL
	Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		30.0	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		47.8	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		29.6	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		35.4	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		47.7	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	71.2	100	ug/L	71	(32%-124%)
2-Fluorobiphenyl	30.7	50.0	ug/L	61	(32%-112%)
2-Fluorophenol	41.3	100	ug/L	41	(15%-88%)
Nitrobenzene-d5	32.6	50.0	ug/L	65	(36%-115%)
Phenol-d5	25.1	100	ug/L	25	(15%-91%)
p-Terphenyl-d14	31.3	50.0	ug/L	63	(36%-121%)

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SDG Number: 2018-1038
Lab Sample ID: 1203926422
Client Sample: QC for batch 1721501
Client ID: CAMO-18-148077MS
Batch ID: 1721502
Run Date: 11/28/2017 17:27
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2819.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 430 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		62.9	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		62.6	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		61.0	ug/L	6.98	23.3
122-66-7	Azobenzene		68.9	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		59.2	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		59.4	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		65.4	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		64.2	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		81.4	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		80.4	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		76.5	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		79.9	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		62.6	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		73.4	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		85.7	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		81.9	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		63.6	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		72.4	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		89.7	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		61.7	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		80.2	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		92.1	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		77.9	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		79.5	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		101	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		80.2	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		55.5	ug/L	6.98	23.3
83-32-9	Acenaphthene		75.0	ug/L	0.698	2.33
208-96-8	Acenaphthylene		70.3	ug/L	0.698	2.33
62-53-3	Aniline		70.7	ug/L	9.77	23.3
120-12-7	Anthracene		78.0	ug/L	0.698	2.33
1912-24-9	Atrazine		89.4	ug/L	6.98	23.3
92-87-5	Benzidine		87.6	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		78.7	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		77.7	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		82.7	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		60.3	ug/L	0.698	2.33

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SDG Number: 2018-1038
Lab Sample ID: 1203926422
Client Sample: QC for batch 1721501
Client ID: CAMO-18-148077MS
Batch ID: 1721502
Run Date: 11/28/2017 17:27
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2819.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 430 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		86.5	ug/L	0.698	2.33
65-85-0	Benzoic acid		120	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		73.2	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		66.5	ug/L	6.98	23.3
218-01-9	Chrysene		80.2	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		82.1	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		72.6	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		66.7	ug/L	0.698	2.33
132-64-9	Dibenzofuran		74.5	ug/L	6.98	23.3
84-66-2	Diethylphthalate		83.1	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		83.1	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		74.0	ug/L	6.98	23.3
206-44-0	Fluoranthene		88.9	ug/L	0.698	2.33
86-73-7	Fluorene		75.3	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		76.9	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		57.8	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		39.8	ug/L	6.98	23.3
67-72-1	Hexachloroethane		56.8	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		64.3	ug/L	0.698	2.33
78-59-1	Isophorone		73.9	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		59.7	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi-n-propylamine		77.7	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		81.1	ug/L	6.98	23.3
91-20-3	Naphthalene		62.5	ug/L	0.698	2.33
98-95-3	Nitrobenzene		72.7	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		89.7	ug/L	6.98	23.3
85-01-8	Phenanthrene		77.2	ug/L	0.698	2.33
108-95-2	Phenol		47.6	ug/L	6.98	23.3
129-00-0	Pyrene		61.9	ug/L	0.698	2.33
110-86-1	Pyridine		36.5	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		74.2	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		77.5	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		76.6	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		69.0	ug/L	6.98	23.3

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SDG Number: 2018-1038	Date Collected: 11/20/2017 10:50	Matrix: W
Lab Sample ID: 1203926422	Date Received: 11/22/2017 08:55	
Client Sample: QC for batch 1721501	Client: ARSL004	Project: QC
Client ID: CAMO-18-148077MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1721502	Inst: MSD4.I	Dilution: 1
Run Date: 11/28/2017 17:27	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 11/27/2017 05:00	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s112817.B\s4k2819.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		76.7	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		104	ug/L	6.98	23.3
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol		71.2	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		75.7	ug/L	6.98	23.3
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline		102	ug/L	6.98	23.3
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	168	233	ug/L	72	(32%-124%)
2-Fluorobiphenyl	71.9	116	ug/L	62	(32%-112%)
2-Fluorophenol	128	233	ug/L	55	(15%-88%)
Nitrobenzene-d5	71.7	116	ug/L	62	(36%-115%)
Phenol-d5	96.3	233	ug/L	41	(15%-91%)
p-Terphenyl-d14	69.6	116	ug/L	60	(36%-121%)

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

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SDG Number: 2018-1038
Lab Sample ID: 1203926423
Client Sample: QC for batch 1721501
Client ID: CAMO-18-148077MSD
Batch ID: 1721502
Run Date: 11/28/2017 17:55
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2820.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 430 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		86.7	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		86.3	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		81.1	ug/L	6.98	23.3
122-66-7	Azobenzene		90.8	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		78.6	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		78.3	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		79.7	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		90.7	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		98.7	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		98.7	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		96.1	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		104	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		79.8	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		83.4	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		104	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		101	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		87.2	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		93.8	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		106	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		86.7	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		102	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		122	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		101	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		101	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		125	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		105	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		69.7	ug/L	6.98	23.3
83-32-9	Acenaphthene		100	ug/L	0.698	2.33
208-96-8	Acenaphthylene		92.0	ug/L	0.698	2.33
62-53-3	Aniline		83.3	ug/L	9.77	23.3
120-12-7	Anthracene		100	ug/L	0.698	2.33
1912-24-9	Atrazine		116	ug/L	6.98	23.3
92-87-5	Benzidine		90.5	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		99.5	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		97.9	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		98.2	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		90.2	ug/L	0.698	2.33

**Semi-Volatile
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Sample Summary**

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SDG Number: 2018-1038
Lab Sample ID: 1203926423
Client Sample: QC for batch 1721501
Client ID: CAMO-18-148077MSD
Batch ID: 1721502
Run Date: 11/28/2017 17:55
Prep Date: 11/27/2017 05:00
Data File: s112817.B\s4k2820.D

Date Collected: 11/20/2017 10:50
Date Received: 11/22/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 430 mL
Column: DB-5ms

Matrix: W
Project: QC
SOP Ref: GL-OA-E-009
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		102	ug/L	0.698	2.33
65-85-0	Benzoic acid		140	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		91.7	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		81.4	ug/L	6.98	23.3
218-01-9	Chrysene		103	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		108	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		98.1	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		98.2	ug/L	0.698	2.33
132-64-9	Dibenzofuran		95.6	ug/L	6.98	23.3
84-66-2	Diethylphthalate		103	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		102	ug/L	6.98	23.3
88-85-7	Dinoseb	U	6.98	ug/L	6.98	23.3
122-39-4	Diphenylamine		95.9	ug/L	6.98	23.3
206-44-0	Fluoranthene		115	ug/L	0.698	2.33
86-73-7	Fluorene		95.0	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		101	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		80.4	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		54.3	ug/L	6.98	23.3
67-72-1	Hexachloroethane		75.6	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		94.5	ug/L	0.698	2.33
78-59-1	Isophorone		97.2	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		72.3	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	6.98	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	6.98	ug/L	6.98	23.3
621-64-7	N-Nitrosodi-n-propylamine		102	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		104	ug/L	6.98	23.3
91-20-3	Naphthalene		86.1	ug/L	0.698	2.33
98-95-3	Nitrobenzene		94.6	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	6.98	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		107	ug/L	6.98	23.3
85-01-8	Phenanthrene		97.9	ug/L	0.698	2.33
108-95-2	Phenol		59.3	ug/L	6.98	23.3
129-00-0	Pyrene		73.6	ug/L	0.698	2.33
110-86-1	Pyridine		46.7	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		97.7	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		102	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		98.9	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		86.5	ug/L	6.98	23.3

**Semi-Volatile
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SDG Number: 2018-1038	Date Collected: 11/20/2017 10:50	Matrix: W
Lab Sample ID: 1203926423	Date Received: 11/22/2017 08:55	
Client Sample: QC for batch 1721501	Client: ARSL004	Project: QC
Client ID: CAMO-18-148077MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1721502	Inst: MSD4.I	Dilution: 1
Run Date: 11/28/2017 17:55	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 11/27/2017 05:00	Aliquot: 430 mL	Final Volume: 1 mL
Data File: s112817.B\s4k2820.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		96.9	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		123	ug/L	6.98	23.3
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol		92.9	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		92.6	ug/L	6.98	23.3
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline		122	ug/L	6.98	23.3
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	204	233	ug/L	88	(32%-124%)
2-Fluorobiphenyl	93.5	116	ug/L	80	(32%-112%)
2-Fluorophenol	162	233	ug/L	69	(15%-88%)
Nitrobenzene-d5	95.5	116	ug/L	82	(36%-115%)
Phenol-d5	121	233	ug/L	52	(15%-91%)
p-Terphenyl-d14	83.8	116	ug/L	72	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1038
Work Order #: 438505**

Method/Analysis Information

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

Analytical Method: SW-846:6850

Prep Method: SW-846:6850

Analytical Batch Number: 1723621

Prep Batch Number: 1723619

Sample Analysis

Sample ID	Client ID
438505001	438505001 (CAMO-18-148061)
438505005	438505005 (CAMO-18-148062)
438505010	438505010 (CAMO-18-148064)
438505012	438505012 (CAMO-18-148063)
1203931745	Interference Check Sample (ICS)
1203931738	Method Blank (MB)
1203931739	Laboratory Control Sample (LCS)
1203931740	438413001(CAMO-18-148067) Matrix Spike (MS)
1203931741	438413001(CAMO-18-148067) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

Calibration Information

Initial Calibration

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

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Interference Check Sample (ICS)

The ICS spike recoveries met the acceptance criteria.

QC Sample Designation

Client sample 438413001 (CAMO-18-148067) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

One or more of the required spiking analytes were not within the acceptance limits in 1203931740 (CAMO-18-148067MS) and 1203931741 (CAMO-18-148067MSD). The recoveries of Perchlorate and Perchlorate 101 were 0%. The acceptance range is 75-125%. The non-conforming recoveries are due to the background concentration in the parent sample (438413001) and the need to dilute all at a 1:10 dilution prior to analysis.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

Samples 1203931740 (CAMO-18-148067MS) and 1203931741 (CAMO-18-148067MSD) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-1038 GEL Work Order: 438505

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 13 DEC 2017

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148061Date Received: 22-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 438505001Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.422	ug/L		1	07-DEC-17 16:50	per1207021a
	Perchlorate Isotope Ratio			2.87			1	07-DEC-17 16:50	per1207021a
14797-73-0	Perchlorate-101	.05	.2	0.440	ug/L		1	07-DEC-17 16:50	per1207021a
	Perchlorate-O(18)			0.400	ug/L		1	07-DEC-17 16:50	per1207021a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148062Date Received: 22-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 438505005Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.339	ug/L		1	07-DEC-17 16:59	per1207022a
	Perchlorate Isotope Ratio			3			1	07-DEC-17 16:59	per1207022a
14797-73-0	Perchlorate-101	.05	.2	0.338	ug/L		1	07-DEC-17 16:59	per1207022a
	Perchlorate-O(18)			0.428	ug/L		1	07-DEC-17 16:59	per1207022a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148064Date Received: 22-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 438505010Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.415	ug/L		1	07-DEC-17 17:34	per1207026a
	Perchlorate Isotope Ratio			2.77			1	07-DEC-17 17:34	per1207026a
14797-73-0	Perchlorate-101	.05	.2	0.448	ug/L		1	07-DEC-17 17:34	per1207026a
	Perchlorate-O(18)			0.412	ug/L		1	07-DEC-17 17:34	per1207026a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148063Date Received: 22-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 438505012Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.515	ug/L		1	07-DEC-17 17:43	per1207027a
	Perchlorate Isotope Ratio			2.99			1	07-DEC-17 17:43	per1207027a
14797-73-0	Perchlorate-101	.05	.2	0.515	ug/L		1	07-DEC-17 17:43	per1207027a
	Perchlorate-O(18)			0.490	ug/L		1	07-DEC-17 17:43	per1207027a

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

*Concentration =

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

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2018-1038

Extract Batch Code: 1723619

Date Filtered: 05-DEC-17

Matrix: WATER

Sample ID: 1203931739

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.202	ug/L	101		85 - 115
Perchlorate Isotope Ratio		2.85				-
Perchlorate-101	0.200	.212	ug/L	106		85 - 115
Perchlorate-O(18)		.471	ug/L			-

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2018-1038

Extract Batch Code: 1723619

Date Extracted: 05-DEC-17

GEL MS/PS ID: 1203931740

Client ID: CAMO-18-148067

GEL MSD/PSD ID: 1203931741

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	11.9	ug/L	11.6	0 *	11.2	0 *	4	30	75 - 125
Perchlorate Isotope Ratio	0	2.99		2.99		2.99		0		-
Perchlorate-101	0.200	11.9	ug/L	11.6	0 *	11.2	0 *	4	30	75 - 125
Perchlorate-O(18)	0	3.67	ug/L	3.87		3.68		5		-

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

Quality Control Data

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 05-DEC-17GEL Job No (SDG): 2018-1038GEL Sample ID: 1203931738Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	07-DEC-17 15:38	per1207013a
	Perchlorate Isotope Ratio						1	07-DEC-17 15:38	per1207013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	07-DEC-17 15:38	per1207013a
	Perchlorate-O(18)			0.474	ug/L		1	07-DEC-17 15:38	per1207013a

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

*Concentration =

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

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: EPA 6850 ModifiedMatrix: WATERExtraction Batch ID: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 05-DEC-17GEL Job No (SDG): 2018-1038GEL Sample ID: 1203931739Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.202	ug/L		1	07-DEC-17 15:47	per1207014a
	Perchlorate Isotope Ratio			2.85			1	07-DEC-17 15:47	per1207014a
14797-73-0	Perchlorate-101	.05	.2	0.212	ug/L		1	07-DEC-17 15:47	per1207014a
	Perchlorate-O(18)			0.471	ug/L		1	07-DEC-17 15:47	per1207014a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-1038GEL Sample ID: 1203931745Date Filtered: 05-DEC-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.225	ug/L		1	07-DEC-17 15:56	per1207015a
	Perchlorate Isotope Ratio			2.9			1	07-DEC-17 15:56	per1207015a
14797-73-0	Perchlorate-101	.05	.2	0.232	ug/L		1	07-DEC-17 15:56	per1207015a
	Perchlorate-O(18)			0.475	ug/L		1	07-DEC-17 15:56	per1207015a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148067MSDate Received: 21-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 1203931740Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	11.6	ug/L		10	07-DEC-17 20:34	per1207046a
	Perchlorate Isotope Ratio			2.99			10	07-DEC-17 20:34	per1207046a
14797-73-0	Perchlorate-101	.5	2	11.6	ug/L		10	07-DEC-17 20:34	per1207046a
	Perchlorate-O(18)			3.87	ug/L		10	07-DEC-17 20:34	per1207046a

^ 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: 1723619Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-148067MSDDate Received: 21-NOV-17GEL Job No (SDG): 2018-1038GEL Sample ID: 1203931741Date Filtered: 05-DEC-17Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.5	2	11.2	ug/L		10	07-DEC-17 20:43	per1207047a
	Perchlorate Isotope Ratio			2.99			10	07-DEC-17 20:43	per1207047a
14797-73-0	Perchlorate-101	.5	2	11.2	ug/L		10	07-DEC-17 20:43	per1207047a
	Perchlorate-O(18)			3.68	ug/L		10	07-DEC-17 20:43	per1207047a

^ 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 #: 2018-1038
Work Order #: 438505

Sample ID	Client ID
438505001	CAMO-18-148061
438505002	CAMO-18-148077
438505005	CAMO-18-148062
438505006	CAMO-18-148078
438505008	CAMO-18-148079
438505010	CAMO-18-148064
438505011	CAMO-18-148080
438505012	CAMO-18-148063
1203926279	Method Blank (MB) ICP
1203928813	Method Blank (MB) ICP
1203926280	Laboratory Control Sample (LCS)
1203928814	Laboratory Control Sample (LCS)
1203926283	438505001(CAMO-18-148061L) Serial Dilution (SD)
1203928817	438505012(CAMO-18-148063L) Serial Dilution (SD)
1203926281	438505001(CAMO-18-148061D) Sample Duplicate (DUP)
1203928815	438505012(CAMO-18-148063D) Sample Duplicate (DUP)
1203926282	438505001(CAMO-18-148061S) Matrix Spike (MS)
1203928816	438505012(CAMO-18-148063S) Matrix Spike (MS)
1203926217	Method Blank (MB) ICP-MS
1203928822	Method Blank (MB) ICP-MS
1203926218	Laboratory Control Sample (LCS)
1203928823	Laboratory Control Sample (LCS)
1203926221	438505001(CAMO-18-148061L) Serial Dilution (SD)
1203928826	438505012(CAMO-18-148063L) Serial Dilution (SD)
1203926219	438505001(CAMO-18-148061D) Sample Duplicate (DUP)
1203928824	438505012(CAMO-18-148063D) Sample Duplicate (DUP)
1203926220	438505001(CAMO-18-148061S) Matrix Spike (MS)
1203928825	438505012(CAMO-18-148063S) Matrix Spike (MS)
1203934941	Method Blank (MB) CVAA
1203934942	Laboratory Control Sample (LCS)
1203934945	438505001(CAMO-18-148061L) Serial Dilution (SD)
1203934943	438505001(CAMO-18-148061D) Sample Duplicate (DUP)
1203934944	438505001(CAMO-18-148061S) Matrix Spike (MS)

Sample Analysis

Samples 438505001,002,005,006,008,010,011 and 012 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch: 1721414, 1722493, 1721388, 1722497, 1724840 and 1726878

Prep Batch : 1721413, 1722492, 1721387, 1722496 and 1724839

Standard Operating Procedures:	GL-MA-E-013 REV# 30, GL-MA-E-006 REV# 14, GL-MA-E-014 REV# 32, GL-MA-E-010 REV# 36 and GL-GC-E-107 REV# 10
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

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

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 438505001 (CAMO-18-148061), 438505005 (CAMO-18-148062) and 438505010 (CAMO-18-148064)-ICP. The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 438505012 (CAMO-18-148063)-ICP.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 438505001 (CAMO-18-148061)-ICP, ICP-MS and CVAA and 438505012 (CAMO-18-148063)-ICP and ICP-MS.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

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

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

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

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-1038 GEL Work Order: 438505

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Nik-Cole Elmore

Date: 19 DEC 2017

Title: Data Validator

Sample Data Summary

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505001**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148061**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 11:45	121117W1-6	1724840

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 438505001

BASIS: As Received

DATE COLLECTED 20-NOV-17

CLIENT ID: CAMO-18-148061

LEVEL: Low

DATE RECEIVED 22-NOV-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-39-3	Barium	19.8	ug/L		1	5	5	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-70-2	Calcium	11900	ug/L		50	200	200	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-47-3	Chromium	15.2	ug/L		3	10	10	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	12/12/17 06:44	121217-2	1721414
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	12/12/17 06:44	121217-2	1721414
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7439-95-4	Magnesium	3250	ug/L		110	300	300	1	P	HSC	12/12/17 06:44	121217-2	1721414
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	12/12/17 06:44	121217-2	1721414
7439-98-7	Molybdenum	0.937	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-09-7	Potassium	1050	ug/L		50	150	150	1	P	HSC	12/12/17 06:44	121217-2	1721414
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7631-86-9	Silica	64600	ug/L		53	213	213	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-23-5	Sodium	8500	ug/L		100	300	300	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-24-6	Strontium	53.1	ug/L		1	5	5	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-61-1	Uranium	0.429	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/28/17 22:06	171128-4	1721388
7440-62-2	Vanadium	4.48	ug/L	J	1	5	5	1	P	HSC	12/12/17 06:44	121217-2	1721414
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	12/12/17 07:56	121217A-1	1721414

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 438505001**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148061**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	43	mg/L		0.453	1.24	1.24	1		TXT1	12/15/17 14:08		1726878

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721388	1721387	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1721414	1721413	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

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

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505002**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148077**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 11:54	121117W1-6	1724840

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505005**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148062**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 11:55	121117W1-6	1724840

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 438505005

BASIS: As Received

DATE COLLECTED 20-NOV-17

CLIENT ID: CAMO-18-148062

LEVEL: Low

DATE RECEIVED 22-NOV-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-39-3	Barium	21.7	ug/L		1	5	5	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-70-2	Calcium	12400	ug/L		50	200	200	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-47-3	Chromium	7.26	ug/L	J	3	10	10	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	12/12/17 06:38	121217-2	1721414
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	12/12/17 06:38	121217-2	1721414
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7439-95-4	Magnesium	3680	ug/L		110	300	300	1	P	HSC	12/12/17 06:38	121217-2	1721414
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	12/12/17 06:38	121217-2	1721414
7439-98-7	Molybdenum	0.870	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-09-7	Potassium	1300	ug/L		50	150	150	1	P	HSC	12/12/17 06:38	121217-2	1721414
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7631-86-9	Silica	69300	ug/L		53	213	213	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-23-5	Sodium	9380	ug/L		100	300	300	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-24-6	Strontium	55.3	ug/L		1	5	5	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-61-1	Uranium	0.464	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/28/17 22:23	171128-4	1721388
7440-62-2	Vanadium	5.63	ug/L		1	5	5	1	P	HSC	12/12/17 06:38	121217-2	1721414
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	12/12/17 07:50	121217A-1	1721414

METALS
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INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 438505005**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148062**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	46.1	mg/L		0.453	1.24	1.24	1		TXT1	12/15/17 14:08		1726878

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721388	1721387	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1721414	1721413	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505006**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148078**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 12:00	121117W1-6	1724840

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505008**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148079**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 12:02	121117W1-6	1724840

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505010**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148064**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 12:04	121117W1-6	1724840

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 438505010

BASIS: As Received

DATE COLLECTED 20-NOV-17

CLIENT ID: CAMO-18-148064

LEVEL: Low

DATE RECEIVED 22-NOV-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-38-2	Arsenic	2.14	ug/L	J	2	5	5	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-39-3	Barium	29.3	ug/L		1	5	5	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-42-8	Boron	17	ug/L	J	15	50	50	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-70-2	Calcium	16100	ug/L		50	200	200	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-47-3	Chromium	25.5	ug/L		3	10	10	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	12/12/17 06:41	121217-2	1721414
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	12/12/17 06:41	121217-2	1721414
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7439-95-4	Magnesium	4470	ug/L		110	300	300	1	P	HSC	12/12/17 06:41	121217-2	1721414
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	12/12/17 06:41	121217-2	1721414
7439-98-7	Molybdenum	0.971	ug/L		0.2	0.5	0.5	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-02-0	Nickel	1.63	ug/L	J	0.6	2	2	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-09-7	Potassium	1290	ug/L		50	150	150	1	P	HSC	12/12/17 06:41	121217-2	1721414
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7631-86-9	Silica	68600	ug/L		53	213	213	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-23-5	Sodium	9960	ug/L		100	300	300	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-24-6	Strontium	71.2	ug/L		1	5	5	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-61-1	Uranium	0.663	ug/L		0.067	0.2	0.2	1	MS	BAJ	11/28/17 22:26	171128-4	1721388
7440-62-2	Vanadium	6.13	ug/L		1	5	5	1	P	HSC	12/12/17 06:41	121217-2	1721414
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	HSC	12/12/17 07:53	121217A-1	1721414

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 438505010**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148064**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	58.6	mg/L		0.453	1.24	1.24	1		TXT1	12/15/17 14:08		1726878

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1721388	1721387	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1721414	1721413	SW846 3005A	50	mL	50	mL	11/24/17	JXM8
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505011**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148080**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 12:05	121117W1-6	1724840

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 438505012**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148063**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.067	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	12/11/17 12:07	121117W1-6	1724840

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 438505012

BASIS: As Received

DATE COLLECTED 20-NOV-17

CLIENT ID: CAMO-18-148063

LEVEL: Low

DATE RECEIVED 22-NOV-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-38-2	Arsenic	2	ug/L	U	2	5	5	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-39-3	Barium	29.3	ug/L		1	5	5	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-42-8	Boron	15.8	ug/L	J	15	50	50	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-70-2	Calcium	18300	ug/L		50	200	200	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-47-3	Chromium	41.7	ug/L		3	10	10	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	HSC	12/13/17 13:36	121317-3	1722493
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	HSC	12/13/17 13:36	121317-3	1722493
7439-92-1	Lead	1.52	ug/L	J	0.5	2	2	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7439-95-4	Magnesium	4890	ug/L		110	300	300	1	P	HSC	12/13/17 13:36	121317-3	1722493
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	HSC	12/13/17 13:36	121317-3	1722493
7439-98-7	Molybdenum	0.949	ug/L		0.2	0.5	0.5	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-02-0	Nickel	1.26	ug/L	J	0.6	2	2	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-09-7	Potassium	1330	ug/L		50	150	150	1	P	HSC	12/13/17 13:36	121317-3	1722493
7782-49-2	Selenium	2.05	ug/L	J	2	5	5	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7631-86-9	Silica	68900	ug/L		53	213	213	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-23-5	Sodium	10100	ug/L		100	300	300	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-24-6	Strontium	82.1	ug/L		1	5	5	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-61-1	Uranium	0.827	ug/L		0.067	0.2	0.2	1	MS	BAJ	12/05/17 18:51	171205-5	1722497
7440-62-2	Vanadium	4.8	ug/L	J	1	5	5	1	P	HSC	12/13/17 13:36	121317-3	1722493
7440-66-6	Zinc	6.25	ug/L	J	3.3	10	10	1	P	HSC	12/13/17 13:36	121317-3	1722493

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-1038**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 438505012**BASIS:** As Received**DATE COLLECTED** 20-NOV-17**CLIENT ID:** CAMO-18-148063**LEVEL:** Low**DATE RECEIVED** 22-NOV-17**MATRIX:** W**%SOLIDS:** 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	65.7	mg/L		0.453	1.24	1.24	1		TXT1	12/15/17 14:08		1726878

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1722493	1722492	SW846 3005A	50	mL	50	mL	11/29/17	JXM8
1722497	1722496	SW846 3005A	50	mL	50	mL	11/29/17	JXM8
1724840	1724839	EPA 245.1/245.2 Prep	20	mL	20	mL	12/08/17	AXS5

***Analytical Methods:**

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-1038

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>
1203926217	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203926279	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	-60.9	ug/L	+/-200	J	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	87.3	ug/L	+/-100	J	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	77.3	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203928813	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

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-1038

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>
	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	73.8	ug/L	+/-150	J	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203928822								
	Antimony	1.42	ug/L	+/-3	J	MS	1	3
	Arsenic	2	ug/L	+/-5	U	MS	2	5
	Cadmium	0.3	ug/L	+/-1	U	MS	0.3	1
	Chromium	3	ug/L	+/-10	U	MS	3	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.2	ug/L	+/-0.5	U	MS	0.2	0.5
	Nickel	0.6	ug/L	+/-2	U	MS	0.6	2
	Selenium	2	ug/L	+/-5	U	MS	2	5
	Silver	0.3	ug/L	+/-1	U	MS	0.3	1
	Thallium	0.6	ug/L	+/-2	U	MS	0.6	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203934941								
	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. 2018-1038 Client ID CAMO-18-148061S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 438505001 Spike ID: 1203926220

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	48.8		1	U	50	97.2		MS
Arsenic	ug/L	75-125	50.5		2	U	50	97.5		MS
Cadmium	ug/L	75-125	50.9		0.3	U	50	102		MS
Chromium	ug/L	75-125	63		15.2		50	95.6		MS
Lead	ug/L	75-125	48.4		0.5	U	50	96.7		MS
Molybdenum	ug/L	75-125	53.3		0.937		50	105		MS
Nickel	ug/L	75-125	49.4		0.6	U	50	97.7		MS
Selenium	ug/L	75-125	49.7		2	U	50	98.6		MS
Silver	ug/L	75-125	51		0.3	U	50	102		MS
Thallium	ug/L	75-125	46.7		0.6	U	50	93.4		MS
Uranium	ug/L	75-125	48.9		0.429		50	97		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1038 Client ID CAMO-18-148061S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 438505001 Spike ID: 1203926282

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4710		68	U	5000	94.2		P
Barium	ug/L	75-125	498		19.8		500	95.6		P
Beryllium	ug/L	75-125	481		1	U	500	96.2		P
Boron	ug/L	75-125	490		15	U	500	96		P
Calcium	ug/L	75-125	16300		11900		5000	88.3		P
Cobalt	ug/L	75-125	488		1	U	500	97.4		P
Copper	ug/L	75-125	493		3	U	500	98.4		P
Iron	ug/L	75-125	4690		30	U	5000	93.7		P
Magnesium	ug/L	75-125	7900		3250		5000	93.1		P
Manganese	ug/L	75-125	482		2	U	500	96.3		P
Potassium	ug/L	75-125	5840		1050		5000	95.8		P
Silica	ug/L		73200		64600		10700	80.3	N/A	P
Sodium	ug/L	75-125	12800		8500		5000	86.1		P
Strontium	ug/L	75-125	539		53.1		500	97.1		P
Tin	ug/L	75-125	491		2.5	U	500	97.8		P
Vanadium	ug/L	75-125	489		4.48	J	500	96.8		P
Zinc	ug/L	75-125	489		3.3	U	500	97.7		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Matrix Spike Summary

SDG NO. 2018-1038 Client ID CAMO-18-148063S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 438505012 Spike ID: 1203928816

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4800		68	U	5000	95.7		P
Barium	ug/L	75-125	520		29.3		500	98.2		P
Beryllium	ug/L	75-125	492		1	U	500	98.4		P
Boron	ug/L	75-125	504		15.8	J	500	97.7		P
Calcium	ug/L	75-125	22600		18300		5000	86.6		P
Cobalt	ug/L	75-125	492		1	U	500	98.4		P
Copper	ug/L	75-125	497		3	U	500	99.3		P
Iron	ug/L	75-125	4800		30	U	5000	95.9		P
Magnesium	ug/L	75-125	9580		4890		5000	93.9		P
Manganese	ug/L	75-125	489		2	U	500	97.6		P
Potassium	ug/L	75-125	6120		1330		5000	95.8		P
Silica	ug/L		77800		68900		10700	83.8	N/A	P
Sodium	ug/L	75-125	14400		10100		5000	84.6		P
Strontium	ug/L	75-125	567		82.1		500	97		P
Tin	ug/L	75-125	489		2.5	U	500	97.4		P
Vanadium	ug/L	75-125	499		4.8	J	500	98.8		P
Zinc	ug/L	75-125	482		6.25	J	500	95.2		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1038 Client ID CAMO-18-148063S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 438505012 Spike ID: 1203928825

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	49.1		1	U	50	96.3		MS
Arsenic	ug/L	75-125	52.4		2	U	50	102		MS
Cadmium	ug/L	75-125	50.6		0.3	U	50	101		MS
Chromium	ug/L	75-125	88.4		41.7		50	93.4		MS
Lead	ug/L	75-125	50.7		1.52	J	50	98.4		MS
Molybdenum	ug/L	75-125	52.6		0.949		50	103		MS
Nickel	ug/L	75-125	49.2		1.26	J	50	95.9		MS
Selenium	ug/L	75-125	53		2.05	J	50	102		MS
Silver	ug/L	75-125	49.1		0.3	U	50	98.2		MS
Thallium	ug/L	75-125	46.7		0.6	U	50	93.4		MS
Uranium	ug/L	75-125	51.8		0.827		50	102		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-1038 Client ID CAMO-18-148061S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 438505001 Spike ID: 1203934944

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.03		0.067	U	2	102		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2018-1038

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-148061D

Matrix: WATER

Level: Low

Sample ID: 438505001

Duplicate ID: 1203926219

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	15.2		15.3		.387		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.937		0.956		2.01		MS
Nickel	ug/L		0.6 U		0.6 U				MS
Selenium	ug/L		2 U		2 U				MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.429		0.409		4.77		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-1038

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-148061D

Matrix: WATER

Level: Low

Sample ID: 438505001

Duplicate ID: 1203926281

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	19.8		20.3		2.85		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	11900		12100		2.28		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	3250		3250		.209		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1050		1120		6.69		P
Silica	ug/L	+/-20%	64600		66400		2.84		P
Sodium	ug/L	+/-20%	8500		8780		3.2		P
Strontium	ug/L	+/-20%	53.1		54.2		2.04		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	4.48 J		4.63 J		3.34		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2018-1038

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-148063D

Matrix: WATER

Level: Low

Sample ID: 438505012

Duplicate ID: 1203928815

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-20%	29.3		29.3		.188		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	15.8 J		15.3 J		3.36		P
Calcium	ug/L	+/-20%	18300		18000		1.29		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	4890		4860		.492		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1330		1340		.901		P
Silica	ug/L	+/-20%	68900		67800		1.51		P
Sodium	ug/L	+/-20%	10100		9970		1.51		P
Strontium	ug/L	+/-20%	82.1		81.1		1.19		P
Tin	ug/L		2.5 U		3 J		200		P
Vanadium	ug/L	+/-5	4.8 J		4.93 J		2.67		P
Zinc	ug/L	+/-10	6.25 J		3.99 J		44.1		P

*Analytical Methods:

P SW846 3005A/6010C

Metals
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Duplicate Sample Summary

SDG No.: 2018-1038

Lab Code: GEL

Contract: ESHL00114

Client ID: CAMO-18-148063D

Matrix: WATER

Level: Low

Sample ID: 438505012

Duplicate ID: 1203928824

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	41.7		40.9		1.98		MS
Lead	ug/L		1.52 J		0.5 U		200		MS
Molybdenum	ug/L	+/- .5	0.949		0.849		11.1		MS
Nickel	ug/L	+/-2	1.26 J		1.31 J		4.13		MS
Selenium	ug/L	+/-5	2.05 J		2.04 J		.196		MS
Silver	ug/L		0.3 U		0.3 U				MS
Thallium	ug/L		0.6 U		0.6 U				MS
Uranium	ug/L	+/- .2	0.827		0.814		1.58		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2018–1038**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–18–148061D**Matrix:** WATER**Level:** Low**Sample ID:** 438505001**Duplicate ID:** 1203934943**Percent Solids for Dup:** N/A

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1038

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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>
1203926218								
	Antimony	ug/L	50	54.5		109	80-120	MS
	Arsenic	ug/L	50	51.7		103	80-120	MS
	Chromium	ug/L	50	49.6		99.3	80-120	MS
	Lead	ug/L	50	50.4		101	80-120	MS
	Molybdenum	ug/L	50	57.5		115	80-120	MS
	Nickel	ug/L	50	49.5		99	80-120	MS
	Selenium	ug/L	50	50.8		102	80-120	MS
	Silver	ug/L	50	53.3		107	80-120	MS
	Thallium	ug/L	50	48.9		97.8	80-120	MS
	Uranium	ug/L	50	49.3		98.5	80-120	MS
	Cadmium	ug/L	50	53.2		106	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1038

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>
1203926280								
	Aluminum	ug/L	5000	4690		93.8	80-120	P
	Barium	ug/L	500	479		95.7	80-120	P
	Beryllium	ug/L	500	475		95.1	80-120	P
	Boron	ug/L	500	476		95.1	80-120	P
	Calcium	ug/L	5000	4690		93.8	80-120	P
	Cobalt	ug/L	500	486		97.3	80-120	P
	Copper	ug/L	500	480		95.9	80-120	P
	Iron	ug/L	5000	4690		93.8	80-120	P
	Magnesium	ug/L	5000	4740		94.9	80-120	P
	Manganese	ug/L	500	479		95.8	80-120	P
	Potassium	ug/L	5000	4790		95.8	80-120	P
	Silica	ug/L	10700	9670		90.3	80-120	P
	Sodium	ug/L	5000	4440		88.7	80-120	P
	Strontium	ug/L	500	481		96.1	80-120	P
	Tin	ug/L	500	482		96.4	80-120	P
	Vanadium	ug/L	500	476		95.1	80-120	P
	Zinc	ug/L	500	465		92.9	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1038

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>
1203928814								
	Aluminum	ug/L	5000	4780		95.6	80-120	P
	Barium	ug/L	500	488		97.7	80-120	P
	Beryllium	ug/L	500	484		96.7	80-120	P
	Boron	ug/L	500	485		97	80-120	P
	Calcium	ug/L	5000	4840		96.8	80-120	P
	Cobalt	ug/L	500	493		98.7	80-120	P
	Copper	ug/L	500	486		97.1	80-120	P
	Iron	ug/L	5000	4790		95.7	80-120	P
	Magnesium	ug/L	5000	4870		97.3	80-120	P
	Manganese	ug/L	500	489		97.8	80-120	P
	Potassium	ug/L	5000	4880		97.5	80-120	P
	Silica	ug/L	10700	9840		91.9	80-120	P
	Sodium	ug/L	5000	4530		90.5	80-120	P
	Strontium	ug/L	500	485		97.1	80-120	P
	Tin	ug/L	500	483		96.7	80-120	P
	Vanadium	ug/L	500	487		97.5	80-120	P
	Zinc	ug/L	500	482		96.3	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1038

Contract: ESHL00114

Aqueous LCS Source: Inorganic Ventures

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>
1203928823								
	Antimony	ug/L	50	48.4		96.7	80-120	MS
	Arsenic	ug/L	50	55.8		112	80-120	MS
	Cadmium	ug/L	50	53.8		108	80-120	MS
	Chromium	ug/L	50	52.3		105	80-120	MS
	Lead	ug/L	50	54.1		108	80-120	MS
	Molybdenum	ug/L	50	52.6		105	80-120	MS
	Nickel	ug/L	50	53.4		107	80-120	MS
	Selenium	ug/L	50	58.1		116	80-120	MS
	Silver	ug/L	50	55.1		110	80-120	MS
	Thallium	ug/L	50	50.9		102	80-120	MS
	Uranium	ug/L	50	54.1		108	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-1038

Contract: ESHL00114

Aqueous LCS Source: GEL

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203934942	Mercury	ug/L	2	2.05		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1038 **Client ID:** CAMO-18-148061L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 438505001 **Serial Dilution ID:** 1203926221

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	15.2		15.4	J	.986			MS
Lead	.5	U	2.5	U				MS
Molybdenum	.937		1	U	1.387			MS
Nickel	.6	U	3	U				MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.429		.465	J	8.392			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1038 Client ID CAMO-18-148061L

Contract: ESHL00114

Matrix: LIQUID Level: Low

Sample ID: 438505001 Serial Dilution ID: 1203926283

<u>Analyte</u>	<u>Initial Value</u> ug/L	<u>C</u>	<u>Serial Value</u> ug/L	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	19.8		20.4	J	3.166			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	11900		11700		1.622		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3250		3200		1.463			P
Manganese	2	U	10	U				P
Potassium	1050		1120		7.425			P
Silica	64600		63800		1.188		10	P
Sodium	8500		8340		1.941		10	P
Strontium	53.1		50.8		4.401		10	P
Tin	2.5	U	12.5	U				P
Vanadium	4.48	J	5	U	1.879			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1038

Client ID: CAMO-18-148063L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 438505012

Serial Dilution ID: 1203928817

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	29.3		29.2		.462			P
Beryllium	1	U	5	U				P
Boron	15.8	J	75	U	48.828			P
Calcium	18300		18500		1.29		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	4890		4990		2.069			P
Manganese	2	U	10	U				P
Potassium	1330		1730		30.839			P
Silica	68900		68500		.488		10	P
Sodium	10100		10000		.711		10	P
Strontium	82.1		80.1		2.379		10	P
Tin	2.5	U	16	J				P
Vanadium	4.8	J	5.9	J	23.116			P
Zinc	6.25	J	19.8	J	216.976			P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1038 **Client ID:** CAMO-18-148063L

Contract: ESHL00114

Matrix: LIQUID **Level:** Low

Sample ID: 438505012 **Serial Dilution ID:** 1203928826

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	41.7		40.5	J	2.893			MS
Lead	1.52	J	2.5	U	.591			MS
Molybdenum	.949		1.05	J	10.643			MS
Nickel	1.26	J	3	U	18.232			MS
Selenium	2.05	J	10	U	174.083			MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.827		.8	J	3.265			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2018-1038 **Client ID:** CAMO-18-148061L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 438505001 **Serial Dilution ID:** 1203934945

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

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1038
Work Order #: 438505**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1720555

Method: SW 9060 Total Organic Carbon

Sample Analysis

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

Sample ID	Client ID
438505002	CAMO-18-148077
438505006	CAMO-18-148078
438505008	CAMO-18-148079
438505011	CAMO-18-148080
1203927018	Method Blank (MB)
1203927019	Laboratory Control Sample (LCS)
1203927021	438305002(CASA-18-147963) Sample Duplicate (DUP)
1203927023	438305002(CASA-18-147963) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 438305002 (CASA-18-147963) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Cyanide and Total

Analytical Batch: 1721219 **Method:** WSP-CN(T)

Prep Batch : 1721218 **Method:** EPA 335.4

Sample Analysis

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

Sample ID	Client ID
438505002	CAMO-18-148077
438505006	CAMO-18-148078
438505008	CAMO-18-148079
438505011	CAMO-18-148080
1203925715	Method Blank (MB)
1203925716	Laboratory Control Sample (LCS)
1203926149	438505002(CAMO-18-148077) Sample Duplicate (DUP)
1203926151	438505002(CAMO-18-148077) 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# 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 Flow Injection analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 438505002 (CAMO-18-148077) was selected for QC analysis.

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

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

Analyte	Sample	Value
Cyanide, Total	1203926151 (CAMO-18-148077MS)	113* (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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: 1721837 and 1724765 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203927309	Method Blank (MB)
1203934721	Method Blank (MB)
1203927310	Laboratory Control Sample (LCS)
1203934722	Laboratory Control Sample (LCS)
1203927311	438413001(CAMO-18-148067) Sample Duplicate (DUP)
1203934723	438902008(CASA-18-148737) Sample Duplicate (DUP)
1203927312	438413001(CAMO-18-148067) Post Spike (PS)
1203934724	438902008(CASA-18-148737) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438413001 (CAMO-18-148067) and 438902008 (CASA-18-148737) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples 1203934723 (CASA-18-148737DUP) and 1203934724 (CASA-18-148737PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Sample Re-analysis

Samples 1203927309 (MB), 1203927310 (LCS), 1203927311 (CAMO-18-148067DUP), 1203927312 (CAMO-18-148067PS), 438505001 (CAMO-18-148061), 438505005 (CAMO-18-148062) and 438505010 (CAMO-18-148064) were re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported.

Miscellaneous Information**Manual Integrations**

Samples 1203927311 (CAMO-18-148067DUP), 1203927312 (CAMO-18-148067PS), 438505001 (CAMO-18-148061), 438505005 (CAMO-18-148062), 438505010 (CAMO-18-148064), 1203934723

(CASA-18-148737DUP) and 438505012 (CAMO-18-148063) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Ammonia Nitrogen
Analytical Batch: 1721371 and 1722580 **Method:** NH3
Prep Batch : 1721370 and 1722577 **Method:** EPA 350.1 Prep

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926135	Method Blank (MB)
1203929023	Method Blank (MB)
1203926136	Laboratory Control Sample (LCS)
1203929024	Laboratory Control Sample (LCS)
1203926139	438505001(CAMO-18-148061) Sample Duplicate (DUP)
1203929025	438505012(CAMO-18-148063) Sample Duplicate (DUP)
1203926142	438505001(CAMO-18-148061) Matrix Spike (MS)
1203929026	438505012(CAMO-18-148063) 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# 10.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Calibration Verification Information

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

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

The MB analyzed with this SDG met the acceptance criteria. In instances where there were positive hits in the method blank, the results were evaluated and appropriately flagged on the data.

Sample	Analyte	Value
1203926135 (MB)	Nitrogen, Ammonia	0.032 between (0.017 - 0.05)

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438505001 (CAMO-18-148061) and 438505012 (CAMO-18-148063) were selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Ammonia	1203926142 (CAMO-18-148061MS)	77.1* (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

Sample1203929023 (MB) was re-analyzed due to instrument failure. The results from the reanalysis are reported.

Sample1203929023 (MB) was re-analyzed due to CCV failure. The reanalysis data with passing instrument QC was reported. Sample1203929023 (MB) was re-analyzed due to (its) proximity to an overrange sample. The results from the reanalysis are reported.

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1721225	Method:	TKN
Prep Batch :	1721224	Method:	EPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
438505002	CAMO-18-148077
438505006	CAMO-18-148078
438505008	CAMO-18-148079
438505011	CAMO-18-148080
1203925737	Method Blank (MB)
1203925738	Laboratory Control Sample (LCS)
1203925739	438413002(CAMO-18-148083) Sample Duplicate (DUP)
1203925741	438413002(CAMO-18-148083) 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# 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 438413002 (CAMO-18-148083) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Samples 1203925738 (LCS) and 438505008 (CAMO-18-148079) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Nitrate Nitrite by Cadmium Reduction

Analytical Batch: 1721373 and 1722581

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926153	Method Blank (MB)
1203929039	Method Blank (MB)
1203926154	Laboratory Control Sample (LCS)
1203929040	Laboratory Control Sample (LCS)
1203926155	438515001(CTUA-17-142758) Sample Duplicate (DUP)
1203929041	438831001(WST03-18-149992) Sample Duplicate (DUP)
1203926159	438515001(CTUA-17-142758) Post Spike (PS)
1203929044	438831001(WST03-18-149992) 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# 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.

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 MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438515001 (CTUA-17-142758) and 438831001 (WST03-18-149992) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203926155 (CTUA-17-142758DUP), 1203926159 (CTUA-17-142758PS) and 438505012 (CAMO-18-148063) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	438505
	012
Nitrogen, Nitrate/Nitrite	10X

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Total Phosphorus
Analytical Batch: 1721223 and 1722574 **Method:** PO4
Prep Batch : 1721222 and 1722573 **Method:** EPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203925727	Method Blank (MB)
1203929007	Method Blank (MB)
1203925728	Laboratory Control Sample (LCS)
1203929008	Laboratory Control Sample (LCS)
1203925729	438413001(CAMO-18-148067) Sample Duplicate (DUP)
1203929009	438831001(WST03-18-149992) Sample Duplicate (DUP)
1203925731	438413001(CAMO-18-148067) Matrix Spike (MS)
1203929010	438831001(WST03-18-149992) 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# 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 Nutrient analysis was performed on a Lachat QuickChem FIA+ 8000 Series.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438413001 (CAMO-18-148067) and 438831001 (WST03-18-149992) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Phosphorus, Total as P	1203929009 (WST03-18-149992DUP)	82.4* (0%-27%)

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

Samples 1203929009 (WST03-18-149992DUP) and 1203929010 (WST03-18-149992MS) in this sample group did not meet the preservation requirements of the method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1721642 and 1722593 **Method:** TDS

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926724	Method Blank (MB)
1203929076	Method Blank (MB)
1203926725	Laboratory Control Sample (LCS)
1203929077	Laboratory Control Sample (LCS)
1203926729	438505010(CAMO-18-148064) Sample Duplicate (DUP)
1203929078	438505012(CAMO-18-148063) 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 MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Samples 438505010 (CAMO-18-148064) and 438505012 (CAMO-18-148063) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Total Dissolved Solids	1203929078 (CAMO-18-148063DUP)	8.4* (0%-5%)

Technical Information

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

Holding Times

Samples (See Below) were logged in for this analysis outside of the method specified holding time. The data is qualified.

Sample	Analyte	Value
1203929078 (CAMO-18-148063DUP)	Total Dissolved Solids	Logged 29-NOV-17, out of holding 27-NOV-17
438505012 (CAMO-18-148063)	Total Dissolved Solids	Logged 29-NOV-17, out of holding 27-NOV-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1721672 and 1722724 **Method:** EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926818	Laboratory Control Sample (LCS)
1203929388	Laboratory Control Sample (LCS)
1203926819	438505001(CAMO-18-148061) Sample Duplicate (DUP)
1203929389	438505012(CAMO-18-148063) 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# 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 Titration and Ion analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438505001 (CAMO-18-148061) and 438505012 (CAMO-18-148063) were selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1721541 and 1722709 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926489	Laboratory Control Sample (LCS)
1203929353	Laboratory Control Sample (LCS)
1203926490	438206003(CAMO-18-147990) Sample Duplicate (DUP)
1203926491	438505010(CAMO-18-148064) Sample Duplicate (DUP)
1203929354	438902007(CASA-18-148734) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438206003 (CAMO-18-147990), 438505010 (CAMO-18-148064) and 438902007 (CASA-18-148734) 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
1203926490 (CAMO-18-147990DUP)	pH	Received 17-NOV-17, out of holding 15-NOV-17
1203926491 (CAMO-18-148064DUP)	pH	Received 22-NOV-17, out of holding 20-NOV-17
1203929354 (CASA-18-148734DUP)	pH	Received 30-NOV-17, out of holding 28-NOV-17
438505001 (CAMO-18-148061)	pH	Received 22-NOV-17, out of holding 20-NOV-17
438505005 (CAMO-18-148062)	pH	Received 22-NOV-17, out of holding 20-NOV-17
438505010 (CAMO-18-148064)	pH	Received 22-NOV-17, out of holding 20-NOV-17
438505012 (CAMO-18-148063)	pH	Received 22-NOV-17, out of holding 20-NOV-17

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1721540 and 1722708 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
438505001	CAMO-18-148061
438505005	CAMO-18-148062
438505010	CAMO-18-148064
438505012	CAMO-18-148063
1203926482	Laboratory Control Sample (LCS)
1203929343	Laboratory Control Sample (LCS)
1203926485	438206003(CAMO-18-147990) Sample Duplicate (DUP)
1203929348	438902007(CASA-18-148734) Sample Duplicate (DUP)
1203926488	438206003(CAMO-18-147990) Matrix Spike (MS)
1203929352	438902007(CASA-18-148734) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

Samples 438206003 (CAMO-18-147990) and 438902007 (CASA-18-148734) were selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-1038 GEL Work Order: 438505

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Kristen Mizzell

Date: 18 DEC 2017

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148061
Sample ID: 438505001
Matrix: W
Collect Date: 20-NOV-17 10:50
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/29/17	0508	1721837	1
Fluoride		0.275	0.033	0.100	mg/L		1					
Chloride		2.19	0.067	0.200	mg/L		1	JXH5	11/30/17	0503	1721837	2
Sulfate		3.22	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0308	0.017	0.050	mg/L	1.00	1	KLP1	11/27/17	1059	1721371	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.17	0.017	0.050	mg/L		1	AXH3	11/24/17	0816	1721373	4
PO4 "As Received"												
Phosphorus, Total as P		0.287	0.020	0.050	mg/L	1.00	1	KLP1	11/28/17	1146	1721223	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		141	3.40	14.3	mg/L			KLP1	11/27/17	1418	1721642	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		56.9	1.45	4.00	mg/L			RXB5	11/29/17	1509	1721540	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		148	1.00	1.00	umhos/cm		1	HXC1	11/27/17	1234	1721672	8
PH "As Received"												
pH at Temp 19.1C	H	7.92	0.010	0.100	SU		1	RXB5	11/29/17	1507	1721541	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/27/17	0700	1721370
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	11/28/17	0930	1721222

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148061
Sample ID: 438505001

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148077
Sample ID: 438505002
Matrix: W
Collect Date: 20-NOV-17 10:50
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	12/01/17	1259	1720555	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/28/17	0706	1721219	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/28/17	1339	1721225	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/28/17	0645	1721218
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	11/28/17	0930	1721224

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

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

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148062
Sample ID: 438505005
Matrix: W
Collect Date: 20-NOV-17 12:39
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/29/17	0539	1721837	1
Fluoride		0.268	0.033	0.100	mg/L		1					
Chloride		2.08	0.067	0.200	mg/L		1	JXH5	11/30/17	0534	1721837	2
Sulfate		2.52	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.144	0.017	0.050	mg/L	1.00	1	KLP1	11/27/17	1101	1721371	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.725	0.017	0.050	mg/L		1	AXH3	11/24/17	0822	1721373	4
PO4 "As Received"												
Phosphorus, Total as P		0.0841	0.020	0.050	mg/L	1.00	1	KLP1	11/28/17	1147	1721223	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		156	3.40	14.3	mg/L			KLP1	11/27/17	1418	1721642	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		64.5	1.45	4.00	mg/L			RXB5	11/29/17	1511	1721540	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		151	1.00	1.00	umhos/cm		1	HXC1	11/27/17	1236	1721672	8
PH "As Received"												
pH at Temp 19.8C	H	7.97	0.010	0.100	SU		1	RXB5	11/29/17	1510	1721541	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/27/17	0700	1721370
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	11/28/17	0930	1721222

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Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148062
Sample ID: 438505005

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1038

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148078

Project: ESHL00114

Sample ID: 438505006

Client ID: ARSL004

Matrix: W

Collect Date: 20-NOV-17 12:39

Receive Date: 22-NOV-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	ND	0.330	1.00	mg/L		1	TSM	12/01/17	1343	1720555	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/28/17	0709	1721219	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/28/17	1340	1721225	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/28/17	0645	1721218
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	11/28/17	0930	1721224

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1038

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148079

Project: ESHL00114

Sample ID: 438505008

Client ID: ARSL004

Matrix: W

Collect Date: 20-NOV-17 11:01

Receive Date: 22-NOV-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.454	0.330	1.00	mg/L		1	TSM	12/01/17	1427	1720555	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/28/17	0710	1721219	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/28/17	1344	1721225	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/28/17	0645	1721218
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	11/28/17	0930	1721224

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148064
Sample ID: 438505010
Matrix: W
Collect Date: 20-NOV-17 13:03
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MAR1	11/29/17	0610	1721837	1
Fluoride		0.339	0.033	0.100	mg/L		1					
Chloride		3.97	0.067	0.200	mg/L		1	JXH5	11/30/17	0605	1721837	2
Sulfate		4.95	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0296	0.017	0.050	mg/L	1.00	1	KLP1	11/27/17	1106	1721371	3
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.983	0.017	0.050	mg/L		1	AXH3	11/24/17	0823	1721373	4
PO4 "As Received"												
Phosphorus, Total as P	J	0.0319	0.020	0.050	mg/L	1.00	1	KLP1	11/28/17	1147	1721223	5
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		180	3.40	14.3	mg/L			KLP1	11/27/17	1418	1721642	6
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		73.4	1.45	4.00	mg/L			RXB5	11/29/17	1514	1721540	7
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		190	1.00	1.00	umhos/cm		1	HXC1	11/27/17	1237	1721672	8
PH "As Received"												
pH at Temp 19.7C	H	8.07	0.010	0.100	SU		1	RXB5	11/29/17	1512	1721541	9

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	11/27/17	0700	1721370
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	11/28/17	0930	1721222

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Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148064
Sample ID: 438505010

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-1038

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148080

Project: ESHL00114

Sample ID: 438505011

Client ID: ARSL004

Matrix: W

Collect Date: 20-NOV-17 13:03

Receive Date: 22-NOV-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.357	0.330	1.00	mg/L		1	TSM	12/01/17	1512	1720555	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	11/28/17	0711	1721219	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.182	0.033	0.100	mg/L	1.00	1	KLP1	11/28/17	1341	1721225	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	11/28/17	0645	1721218
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	AXH3	11/28/17	0930	1721224

The following Analytical Methods were performed:

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

Lc/LC: Critical Level

DL: Detection Limit

PF: Prep Factor

MDA: Minimum Detectable Activity

RL: Reporting Limit

MDC: Minimum Detectable Concentration

SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148063
Sample ID: 438505012
Matrix: W
Collect Date: 20-NOV-17 13:03
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	12/08/17	2102	1724765	1
Chloride		5.37	0.067	0.200	mg/L		1					
Fluoride		0.252	0.033	0.100	mg/L		1					
Sulfate		8.47	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0218	0.017	0.050	mg/L	1.00	1	KLP1	12/04/17	1053	1722580	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		2.99	0.170	0.500	mg/L		10	KLP1	12/04/17	1022	1722581	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0202	0.020	0.050	mg/L	1.00	1	KLP1	12/01/17	1534	1722574	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids	H	177	3.40	14.3	mg/L			KLP1	12/01/17	1002	1722593	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		68.7	1.45	4.00	mg/L			RXB5	11/30/17	1348	1722708	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		235	1.00	1.00	umhos/cm		1	RXB5	11/30/17	1425	1722724	7
PH "As Received"												
pH at Temp 13.7C	H	7.95	0.010	0.100	SU		1	RXB5	11/30/17	1346	1722709	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/04/17	0740	1722577
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	AXH3	12/01/17	1100	1722573

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Certificate of Analysis

Report Date: December 18, 2017

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

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-1038

Client Sample ID: CAMO-18-148063
Sample ID: 438505012

Project: ESHL00114
Client ID: ARSL004

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

Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

Quality Control Summary

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QC Summary

Report Date: December 18, 2017

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

Contact: Ms. Nita Patel

Workorder: 438505

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1720555										
QC1203927021	438305002	DUP									
Total Organic Carbon Average		J	0.550	J	0.514	mg/L	6.77 ^	(+/-1.00)	TSM	11/30/17	20:59
QC1203927019	LCS										
Total Organic Carbon Average	10.0				9.96	mg/L		99.6 (80%-120%)		11/30/17	12:35
QC1203927018	MB										
Total Organic Carbon Average			U	ND	mg/L					11/30/17	12:24
QC1203927023	438305002	PS									
Total Organic Carbon Average	10.0	J	0.550		10.7	mg/L		101 (75%-125%)		11/30/17	21:43
Flow Injection Analysis											
Batch	1721219										
QC1203926149	438505002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	11/28/17	07:07
QC1203925716	LCS										
Cyanide, Total	50.0				51.1	ug/L		102 (90%-110%)		11/28/17	06:52
QC1203925715	MB										
Cyanide, Total			U	ND	ug/L					11/28/17	06:51
QC1203926151	438505002	MS									
Cyanide, Total	100	U	ND		113	ug/L		113* (90%-110%)		11/28/17	07:08
Ion Chromatography											
Batch	1721837										
QC1203927311	438413001	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	11/29/17	02:34

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1721837										
Chloride		2.94		2.93	mg/L	0.388		(0%-20%)	MXL2	12/01/17	01:58
Fluoride		0.249		0.214	mg/L	15.1	^	(+/-0.100)	MAR1	11/29/17	02:34
Sulfate		5.39		5.41	mg/L	0.377		(0%-20%)	MXL2	12/01/17	01:58
QC1203927310 LCS											
Bromide	1.25			1.24	mg/L		99.2	(80%-120%)	MAR1	11/28/17	23:28
Chloride	5.00			4.72	mg/L		94.3	(80%-120%)	MXL2	11/30/17	22:52
Fluoride	2.50			2.59	mg/L		104	(80%-120%)	MAR1	11/28/17	23:28
Sulfate	10.0			9.77	mg/L		97.7	(80%-120%)	MXL2	11/30/17	22:52
QC1203927309 MB											
Bromide			U	ND	mg/L				MAR1	11/28/17	22:57
Chloride			U	ND	mg/L				MXL2	11/30/17	22:21
Fluoride			U	ND	mg/L				MAR1	11/28/17	22:57
Sulfate			U	ND	mg/L				MXL2	11/30/17	22:21
QC1203927312 438413001 PS											
Bromide	1.25	U	ND	1.16	mg/L		87.7	(75%-125%)	MAR1	11/29/17	03:05
Chloride	5.00		2.94	8.22	mg/L		106	(75%-125%)	MXL2	12/01/17	02:28
Fluoride	2.50		0.249	2.50	mg/L		90.2	(75%-125%)	MAR1	11/29/17	03:05
Sulfate	10.0		5.39	15.9	mg/L		105	(75%-125%)	MXL2	12/01/17	02:28

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1724765										
QC1203934723	438902008	DUP									
Bromide		5.12		5.14	mg/L	0.316		(0%-20%)	MXL2	12/09/17	02:11
Chloride		8.81		8.87	mg/L	0.713		(0%-20%)		12/11/17	14:29
Fluoride		0.321		0.263	mg/L	19.9 ^		(+/-0.100)		12/09/17	02:11
Sulfate		43.0		42.4	mg/L	1.24		(0%-20%)		12/11/17	14:29
QC1203934722	LCS										
Bromide	1.25			1.23	mg/L		98.5	(80%-120%)		12/08/17	20:31
Chloride	5.00			4.61	mg/L		92.1	(80%-120%)			
Fluoride	2.50			2.44	mg/L		97.5	(80%-120%)			
Sulfate	10.0			9.66	mg/L		96.6	(80%-120%)			
QC1203934721	MB										
Bromide			U	ND	mg/L					12/08/17	20:00
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203934724	438902008	PS									
Bromide	1.25	5.12		6.32	mg/L		95.6	(75%-125%)		12/09/17	02:42
Chloride	5.00	1.76		6.56	mg/L		96	(75%-125%)		12/11/17	15:00

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1724765										
Fluoride	2.50	0.321		3.09	mg/L		111	(75%-125%)	MXL2	12/09/17	02:42
Sulfate	10.0	8.60		18.6	mg/L		100	(75%-125%)		12/11/17	15:00
Nutrient Analysis											
Batch	1721223										
QC1203925729	438413001	DUP									
Phosphorus, Total as P		0.614		0.578	mg/L	6.04		(0%-27%)	KLP1	11/28/17	11:38
QC1203925728	LCS										
Phosphorus, Total as P	1.00			1.07	mg/L		107	(80%-124%)		11/28/17	11:34
QC1203925727	MB										
Phosphorus, Total as P			U	ND	mg/L					11/28/17	11:33
QC1203925731	438413001	MS									
Phosphorus, Total as P	1.00	0.614		1.56	mg/L		94.6	(63%-139%)		11/28/17	11:39
Batch	1721225										
QC1203925739	438413002	DUP									
Nitrogen, Total Kjeldahl		0.228		0.273	mg/L	18 ^		(+/-0.100)	KLP1	11/28/17	13:29
QC1203925738	LCS										
Nitrogen, Total Kjeldahl	1.00			1.07	mg/L		107	(90%-110%)		11/28/17	13:37
QC1203925737	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					11/28/17	13:24
QC1203925741	438413002	MS									
Nitrogen, Total Kjeldahl	1.00	0.228		1.18	mg/L		95.2	(90%-110%)		11/28/17	13:30
Batch	1721371										
QC1203926139	438505001	DUP									
Nitrogen, Ammonia	J	0.0308		0.0803	mg/L	89.1 ^		(+/-0.050)	KLP1	11/27/17	11:00

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1721371										
QC1203926136	LCS										
Nitrogen, Ammonia	1.00			1.09	mg/L		109	(90%-110%)	KLP1	11/27/17	10:49
QC1203926135	MB										
Nitrogen, Ammonia			J	0.032	mg/L					11/27/17	10:49
QC1203926142	438505001	MS									
Nitrogen, Ammonia	1.00	J	0.0308	0.802	mg/L		77.1 *	(90%-110%)		11/27/17	11:01
Batch	1721373										
QC1203926155	438515001	DUP									
Nitrogen, Nitrate/Nitrite			3.35	3.32	mg/L	0.9		(0%-20%)	AXH3	11/24/17	08:56
QC1203926154	LCS										
Nitrogen, Nitrate/Nitrite	1.00			0.992	mg/L		99.2	(90%-110%)		11/24/17	07:54
QC1203926153	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					11/24/17	07:53
QC1203926159	438515001	PS									
Nitrogen, Nitrate/Nitrite	1.00		0.335	1.37	mg/L		104	(90%-110%)		11/24/17	08:57
Batch	1722574										
QC1203929009	438831001	DUP									
Phosphorus, Total as P			0.683	1.64	mg/L	82.4 *		(0%-27%)	KLP1	12/01/17	15:58
QC1203929008	LCS										
Phosphorus, Total as P	1.00			1.07	mg/L		107	(80%-124%)		12/01/17	15:33
QC1203929007	MB										
Phosphorus, Total as P			U	ND	mg/L					12/01/17	15:32
QC1203929010	438831001	MS									
Phosphorus, Total as P	1.00		0.683	1.88	mg/L		120	(63%-139%)		12/01/17	15:59

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1722580										
QC1203929025	438505012	DUP									
Nitrogen, Ammonia	J	0.0218	J	0.020	mg/L	8.61	^	(+/-0.050)	KLP1	12/04/17	10:54
QC1203929024	LCS										
Nitrogen, Ammonia	1.00			1.10	mg/L		110	(90%-110%)		12/04/17	10:52
QC1203929023	MB										
Nitrogen, Ammonia			U	ND	mg/L					12/04/17	14:29
QC1203929026	438505012	MS									
Nitrogen, Ammonia	1.00	J	0.0218	0.987	mg/L		96.5	(90%-110%)		12/04/17	10:55
Batch	1722581										
QC1203929041	438831001	DUP									
Nitrogen, Nitrate/Nitrite	U	ND	U	ND	mg/L	N/A			KLP1	12/04/17	10:41
QC1203929040	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.06	mg/L		106	(90%-110%)		12/04/17	10:21
QC1203929039	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					12/04/17	10:19
QC1203929044	438831001	PS									
Nitrogen, Nitrate/Nitrite	1.00	U	ND	1.05	mg/L		104	(90%-110%)		12/04/17	10:42
Solids Analysis											
Batch	1721642										
QC1203926729	438505010	DUP									
Total Dissolved Solids		180		176	mg/L	2.41		(0%-5%)	KLP1	11/27/17	14:18
QC1203926725	LCS										
Total Dissolved Solids	300			313	mg/L		104	(95%-105%)		11/27/17	14:18

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1721642										
QC1203926724	MB										
Total Dissolved Solids			U	ND	mg/L				KLP1	11/27/17	14:18
Batch	1722593										
QC1203929078	438505012	DUP									
Total Dissolved Solids		H	177	H	163	mg/L	8.4*	(0%-5%)	KLP1	12/01/17	10:02
QC1203929077	LCS										
Total Dissolved Solids	300				296	mg/L		98.6 (95%-105%)		12/01/17	10:02
QC1203929076	MB										
Total Dissolved Solids			U	ND	mg/L					12/01/17	10:02
Titration and Ion Analysis											
Batch	1721540										
QC1203926485	438206003	DUP									
Alkalinity, Total as CaCO3		U	ND	U	ND	mg/L	N/A		RXB5	11/29/17	14:49
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203926482	LCS										
Alkalinity, Total as CaCO3	100				107	mg/L		107 (90%-110%)		11/29/17	14:19
QC1203926488	438206003	MS									
Alkalinity, Total as CaCO3	100	U	ND		108	mg/L		107 (80%-120%)		11/29/17	14:50
Batch	1721541										
QC1203926490	438206003	DUP									
pH		H	6.47	H	6.29	SU	2.82	(0%-5%)	RXB5	11/29/17	14:46
QC1203926491	438505010	DUP									
pH		H	8.07	H	8.08	SU	0.124	(0%-5%)		11/29/17	15:13

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1721541										
QC1203926489	LCS										
pH	7.00			7.00	SU		100	(99%-101%)	RXB5	11/29/17	14:18
Batch	1721672										
QC1203926819	438505001	DUP									
Conductivity		148		148	umhos/cm	0.203		(0%-10%)	HXC1	11/27/17	12:34
QC1203926818	LCS										
Conductivity	1410			1400	umhos/cm		98.9	(95%-105%)		11/27/17	12:33
Batch	1722708										
QC1203929348	438902007	DUP									
Alkalinity, Total as CaCO3		105		105	mg/L	0		(0%-20%)	RXB5	11/30/17	14:03
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203929343	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		11/30/17	13:07
QC1203929352	438902007	MS									
Alkalinity, Total as CaCO3	100	105		212	mg/L		106	(80%-120%)		11/30/17	14:04
Batch	1722709										
QC1203929354	438902007	DUP									
pH	H	8.24	H	8.26	SU	0.242		(0%-5%)	RXB5	11/30/17	14:01
QC1203929353	LCS										
pH	7.00			7.01	SU		100	(99%-101%)		11/30/17	13:45
Batch	1722724										
QC1203929389	438505012	DUP									
Conductivity		235		227	umhos/cm	3.46		(0%-10%)	RXB5	11/30/17	14:28

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QC Summary

Workorder: 438505

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1722724										
QC1203929388	LCS										
Conductivity	1410			1360	umhos/cm		96.5	(95%-105%)	RXB5	11/30/17	14:23

Notes:

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

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

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

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

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

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

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-1038
Work Order #: 438505**

"
"
"

Method/Analysis Information

"

Product: Alphaspec Am241 Liquid

Cpcn\decn'O gj qf <' J CUN/522-CO/463

Cpcn\decn'Dcej 'P wo dgt<' 3944329

"

Sample ID ""Client ID

65: 727224" " ECO Q/3: /36: 299

65: 727228" ""ECO Q/3: /36: 29:

65: 72722: " ""ECO Q/3: /36: 29;

65: 727233" ""ECO Q/3: /36: 2: 2

3425; 49; 46""O gj qf 'Drcpm'O D+

3425; 49; 48""Nedqtcvt { 'Eqptqn'Uco r ng'*NEU+

3425; 49; 47""65: 727224*ECO Q/3: /36: 299+'Uco r ng'F wr decvg'*F WR+

"

Vj g'uco r ngu'lp'y ku'UF I 'y gtg'cpcn| gf "qp"cp"\$cu'tgegkxgf '\$'dcuku0"

"

SOP Reference"

Rtqegf wtg'hqt'r tgr ctcvkp."cpcn\uku'cpf 'tgr qt vpi "qh'cpcn\decn'f cvc"ctg'eqptqmgf 'd { 'I GN'Nedqtcvtlgu'NNE'cu
Ucpf ctf "Qr gtcvpi 'Rtqegf wtg'*UR+0Vj g'f cvc'f kuewugf 'lp'y ku'pcttcvkg'j cu'dggp'cpcn| gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/233"TGX%480"

Calibration Information:

"

Calibration Information"

Cm'lpklcn'cpf 'eqpvkp'pi 'ecrldtcvqp'tgs vkt go gpw'j cxg'dggp'o g'0Ecrldtcvqp'ctg'r gthqto gf 'o qpvy n' 'wulpi
o kzgf "cm'j c'ucpf ctf u'eqo r tkgf "qh'y g'hqmy lpi <'I f/36: . 'P r/459.'cpf 'Eo /4660Vj g'lpklcn'Ecrldtcvqp'y cu
r gthqto gf 'lp'P qxgo dgt'42390"

"

Standards Information"

Ucpf ctf 'uqnwkp'pu'hqt'y gug'cpcn\uku'ctg'P KUV'tcegcdrg'qt'xgtklgf 'y kj "c'P KUV'tcegcdrg'ucpf ctf 'cpf 'wugf
dghqtg'y g'g'zr ktcvkp'f cvgu0"

"

Sample Geometry"

Cm'eqwvpi 'uqwtgu'y gtg'r tgr ctgf 'lp'y g'uco g'i gqo gvt { 'cu'y g'ecrldtcvqp'ucpf ctf u0"

Quality Control (QC) Information:

"

Blank Information"

Cks wqu'hqt'uco r ngu'3425; 49; 46*"O D+'cpf "3425; 49; 48*"NEU+y gtg'ej cpi gf "q'302."cpf 'y g'OF Eu'cpf 'Ne'kh
tgs wugvf +hqt'cm'uco r ngu'ctg'ecrewcvgf 'wulpi "c'drcpm'r qr wcvkp'r gt'erlcpv'tgs wgu0"

"

Method Blank Criteria""

Vj g'O gj qf 'Drcpm*O D+o gv'ceegr vpeg'etkgtk0"

"

CSU""

Vj g'drcpnltguwn'ku'guu'yj cp'3(87"ko gu'yj g'E UW0"

"

Blank Decision Level""

Vj g'drcpnltguwn'ku'guu'yj cp'yj g'f gekukqp'rgxgr0"

"

Tracer/Carrier Yield "

Cm'l{ kgrf u'o gv'yj g'tgs wktgf "ceegr vpeg'hko ku0"

"

Laboratory Control Sample (LCS) Recovery""

Vj g'NEU'ur kng'tgeqxtkgu'o gv'yj g'ceegr vpeg'hko ku0"

"

Designated QC""

Vj g'hqmqy kpi 'uco r rg'y cu'wugf 'hqt'S E<65: 727224*ECO Q/3: /36: 299+0Vj g'S E'y cu'ltqo 'CTUN'y qtmqtf gt 65: 7270"

"

Duplication Criteria between QC Sample and Duplicate Sample""

Vj g'S E'Uco r rg'cpf 'F w rdecvg'Uco r rg'*F WR+o gv'yj g'f w rdecvqp"ceegr vpeg'etkgtk0"

"

RDL Met""

Vj g'o gj qf 'TFN'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time""

Cm'uco r rg'r tqegf wgu'hqt'yj ku'uco r rg'ugv'y gtg'r gthqto gf'y kj kp'yj g'tgs wktgf'j qrf kpi 'ko g0"

"

Negative > 3 sigma TPU""

Uco r ngu'tguwnu'ctg'pqv'o qtg'pgi cvkxg'yj cp'yj tgg'uki o c"VRW0"

"

Sample Re-prep/Re-analysis""

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r rg'ugv'tgs wktgf'tgr tgr "qt'tgcpcn(uku0"

"

Recounts""

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r rg'ugv'y gtg'tgeqwpvgf 0"

Miscellaneous Information:"

"

Manual Integration""

P q'o cpwcn'lpvgi tcvqpu'y gtg'r gthqto gf'qp'f cvc'lp'yj ku'dcvxj 0"

"

Sample-Specific MDA/MDC""

Vj g'O F C I O F E'tgr qtvgf "qp'yj g'egtwhcvg'qh'cpcn(uku'ku'c'uco r rg/ur gekhe'O F C I O F E0"

"

Additional Comments""

Cf fklqpcn'eqo o gpwu'y gtg'pqv'tgs wktgf'hqt'yj ku'uco r rg'ugv0"

Qualifier Information""

"

O cpwcn's wcn'kgtu'y gtg'pqv'tgs wktgf 0"

"

"

"

Method/Analysis Information"

"

Product: ISOPU

Cpcn\ \ecni'O gj qf <" J CUN/522-KUQRW

Cpcn\ \ecni'Dcevej 'P wo dgt<" 394432:

"

Sample ID "Client ID

65: 727224" " ECO Q/3: /36: 299

65: 727228" "ECO Q/3: /36: 29:

65: 72722: " "ECO Q/3: /36: 29;

65: 727233" "ECO Q/3: /36: 2: 2

3425; 49; 49" "O gj qf 'Drcpmi'O D+

3425; 49; 4; " "Ncdqtcvqt { 'Eqpvtqnl'Uco r ng"NEU+

3425; 49; 4: " "65: 727224*ECO Q/3: /36: 299+"Uco r ng'F w rdecvg"WR+

"

Vj g'uco r ngu'lp'y ku'UF I 'y gtg'cpcn| gf "qp'cp"\$cu'tgegkxgf \$"dcuku0"

"

SOP Reference"

Rtqegf wtg'hqt'r tgr ctcvkqp."cpcn\ uku'cpf 'tgr qt vki "qh'cpcn\ \ecni'f cve'ctg"eqpvtqngf "d { 'I GN'Ncdqtcvqtkgu'NNE"cu
Ucpf ctf "Qr gtcvki "Rtqegf wtg*"UQR+0Vj g'f cve'f kuewugf 'lp'y ku'pcttcvkxg'j cu'dggp'cpcn| gf "lp'ceeqtf cpeg'y kj
I N/TCF/C/233"TGX%480"

Calibration Information:"

"

Calibration Information"

Cm\lpk\cni'cpf "eqp\vpkpi "ecr\dtcvkp'tgs wktgo gpw'j cxg'dggp'o g\0Ecr\dtcvkpu'ctg'r gthqto gf "o qpy n\ "wukpi
o k\gf "cm'j c"ucpf ctf u'eqo r tkugf "qh'y g'hqmgy lpi <I f/36: . 'P r/459."cpf 'Eo /4660Vj g'lpk\cni'Ecr\dtcvkp'y cu
r gthqto gf "lp'P qxgo dgt"42390"

"

Standards Information"

Ucpf ctf "uq\w\kpu'hqt'y gug'cpcn\ uku'ctg'P KU'V'tcegcdng'qt'xgtk\hgf "y kj "c'P KU'V'tcegcdng'ucpf ctf "cpf "wugf
dghqtg'y g'g\zr kcvkp'f cvgu0"

"

Sample Geometry"

Cm\eqvpkpi "uq\tegu'y gtg'r tgr ctgf "lp'y g'uco g'i gqo gwt { "cu'y g'ecr\dtcvkp'ucpf ctf u0"

Quality Control (QC) Information:"

"

Blank Information"

Cks wqu'hqt'uco r ngu'3425; 49; 49*"O D+"cpf "3425; 49; 4; "NEU+y gtg'ej cpi gf "q'30."cpf "y g'O F Eu*"cpf "Ne'kh
tgs wguvgf +hqt'cm\uco r ngu'ctg'ecr\w\vgf "wukpi "c'drcpmi\ qr w\cvkp'r gt'erl\gpv'tgs wgu0"

"

Method Blank Criteria"

Vj g'O gj qf "Drcpmi'O D+"o gv'ceegr wpeg'etkgtkc0"

"

CSU"

Vj g'drcpmi\guw\ku'guu'y cp'3087"ko gu'y g'E UW0"

"

Blank Decision Level"

Vj g"dnrpnlt guwn'ku'guu'vj cp'vj g'f gekukqp'rgxgr0"

"

Tracer/Carrier Yield "

Uco r rg"Ugg'Dgrny +f kf "pqv'o ggv'vj g'engpva'f' kgrf 'tgs wkt go gpv0J qy gxgt. "vj gtg'ctg'622'tcegt'eqwpw. 'I GNau ucpf ctf "tcegt" { kgrf 'tgs wkt go gpv'ctg'o gv'cpf "vj g'engpva'f' gvev'kp'ho ku'ctg'o gv0

Sample	Analyte	Value
65: 727233"ECO Q/3: /36: 2: 2+	Rnwqpkwo /464"Vtcegt	5; 0 , '72' /327' +

"

Laboratory Control Sample (LCS) Recovery"

Vj g'NEU'ur kng'tgeqxtkgu'o gv'vj g'ceegr vpeg'ho ku0"

"

Designated QC"

Vj g'hqmqy kpi 'uco r rg'y cu'wugf 'hqt'S E<65: 727224"ECO Q/3: /36: 299+0Vj g'S E'y cu'htqo 'CTUN'y qtnlqtf gt 65: 7270"

"

Duplication Criteria between QC Sample and Duplicate Sample"

Vj g'S E'Uco r rg'cpf 'F wr nlecvg'Uco r rg'"F WR+o gv'vj g'f wr nlecvkp'ceegr vpeg'etkgtlc0"

"

RDL Met"

Vj g'o gvj qf "TF N'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time"

Cml'uco r rg'r tqegf wgu'hqt'vj ku'uco r rg'ugv'y gtg'r gthqto gf 'y kj kp'vj g'tgs wkt gf "j qrf kpi "ko g0"

"

Negative > 3 sigma TPU"

Uco r ngu'tguwnu'ctg'pqv'o qtg'pgi cvkxg'vj cp'vj tgg'uki o c"VRW0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'vj g'uco r ngu'kp'vj ku'uco r rg'ugv'tgs wkt gf 'tgr tgr "qt'tgcpcn'uku0"

"

Recounts"

Uco r rg'65: 727233"ECO Q/3: /36: 2: 2+"y cu'tgeqwpvgf "f wg'vq'ny "ectt'kgt htcegt" { kgrf 0Vj g'tgeqwpv'ku'tgr qtvf 0"

Miscellaneous Information:"

"

Manual Integration"

P q'o cpwcn'lpvgi tcvkpu'y gtg'r gthqto gf "qp'f cv'kp'vj ku'dcvej 0"

"

Sample-Specific MDA/MDC"

Vj g'O F C I O F E'tgr qtvf "qp'vj g'egt w'hecvg'qh'cpcn'uku'ku'c'uco r rg'ur gekhe'O F C I O F E0"

"

Additional Comments"

C f f k k q p c n'eqo o gpw'y gtg'pqv'tgs wkt gf 'hqt'vj ku'uco r rg'ugv0"

Qualifier Information"

"

O cpwcn's wcn'htu'y gtg'pqv'tgs wkt gf 0"

"

"

"

Method/Analysis Information"

"

Product: IsoU
Cpcn\ \ecniO gj qf < J CUN/522-KUQW
Cpcn\ \ecniDvej 'P wo dgt< 394432;

"

Sample ID ""Client ID
65: 727224" " ECO Q/3: /36: 299
65: 727228" ""ECO Q/3: /36: 29:
65: 72722: " ""ECO Q/3: /36: 29;
65: 727233" ""ECO Q/3: /36: 2: 2
3425; 49; 52""O gj qf 'Drcpmi*O D+
3425; 49; 54""Ncdqtcvqt { 'Eqpvtqnl'Uco r rg"*NEU+
3425; 49; 53""65: 727224*ECO Q/3: /36: 299+"Uco r rg'F wr rlecvg"*F WR+

"

Vj g'uco r ngu'lp'yj ku'UF I 'y gtg'cpcn| gf "qp'cp"\$cu'tgegkxgf \$"dcuku0"

"

SOP Reference""

Rtqegf wtg'hqt'r tgr ctcvkqp."cpcn\ uku'cpf 'tgr qt vkpi 'qh'cpcn\ \ecni'f cwc'tg"eqpvtqngf 'd { 'I GN'Ncdqtcvqtkgu'NNE'cu
Ucpf ctf "Qr gtcvkpi 'Rtqegf wtg"*UQR+0Vj g'f cwc'f kucwugf 'lp'yj ku'pcttcvkxg'j cu'dggp'cpcn| gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/233"TGX%480"

Calibration Information:"

"

Calibration Information""

Cm\lpklci'cpf "eqpvpwki 'ecrkdtevkp'tgs wktgo gpw'j cxg'dggp'o gv0Ecrkdtevkpu'ctg'r gthqto gf 'o qpyj n' 'wukpi
o k zgf 'cm j c'ucpf ctf u'eqo r tkugf "qh'yj g'hqm y lpi <I f/36: . 'P r/459.'cpf 'Eo /4660Vj g'lpklci'Ecrkdtevkpu'y gtg
r gthqto gf 'lp'F gego dgt'4239'cpf 'P qxgo dgt'42390"

"

Standards Information""

Ucpf ctf "uqrvwkp'u'ht'yj gug'cpcn\ uku'ctg'P KUV'tcegcdng'qt'xgtkhgf "y kj 'c'P KUV'tcegcdng'ucpf ctf "cpf "wugf
dghqtg'yj g'gzr kcvkqp'f cvgu0"

"

Sample Geometry""

Cm\eqwvki "uqwegu'y gtg'r tgr ctgf "lp'yj g'uco g'i gqo gw { "cu'yj g'ecrkdtevkp'ucpf ctf u0"

Quality Control (QC) Information:"

"

Blank Information""

Cks wqu'ht'uco r ngu'3425; 49; 52"*O D+cpf "3425; 49; 54"*NEU+y gtg'ej cpi gf "q'302."cpf "y g'O F Eu"*cpf 'Ne'kh
tgs wguvgf +hqt "cm\uco r ngu'ctg'ecrwwvgf "wukpi 'c'drcpmi'qr wcvkqp'r gt'erlcpv'tgs wgu0"

"

Method Blank Criteria""

Vj g'O gj qf 'Drcpmi*O D+o gv'ceegr wpeg'etkgtk0"

"

CSU""

Vj g'drcpmi*Ugg'Dgrny +tguwn'ku'i tgcvt'yj cp'3087"ko gu'yj g'E UW'dw'huu'yj cp'yj g'O F E0'

Sample	Analyte	Value
3425; 49; 52*O D+	Wcpkwo /455456.'Wcpkwo /457458'cpf 'Wcpkwo /45:	Drcpmi'tguwn"@3087'E UW

"

Blank Decision Level"

Vj g"drpni*Ugg'Dgrny +tguwn'ku'i tgcvt 'y cp'yj g'f gekukqp'hxgn'dw'rgu'vj cp'yj g'O F E0'

Sample	Analyte	Value
3425; 49; 52*O D+	Wcpkwo /457458'cpf 'Wcpkwo /45:	Drcpnitguwn'@F N

"

Tracer/Carrier Yield "

Cml'f lgrf u'o gv'vj g'tgs wktgf 'ceegr vpeg'hko ku0"

"

Laboratory Control Sample (LCS) Recovery"

Vj g'NEU'ur kng'tgeqxtkgu'o gv'vj g'ceegr vpeg'hko ku0"

"

Designated QC"

Vj g'hqmqy lpi 'uco r rg'y cu'wugf 'hqt'S E<65: 727224*ECO Q/3: /36: 299+0Vj g'S E'y cu'ltqo 'CTUN'y qtnlqtf gt 65: 7270"

"

Duplication Criteria between QC Sample and Duplicate Sample"

Vj g'S E'Uco r rg'cpf 'F wr rlecvg'Uco r rg'*F WR+o gv'vj g'f wr rlecwqp'ceegr vpeg'etkgtkc0"

"

RDL Met"

Vj g'o gvj qf 'TF N'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time"

Cml'uco r rg'r tqegf wgu'hqt'yj ku'uco r rg'ugv'y gtg'r gthqto gf 'y kj kp'yj g'tgs wktgf 'j qrf lpi 'ko g0"

"

Negative > 3 sigma TPU"

Uco r ngu'tguwnu'ctg'pqv'o qtg'pgi c'kxg'yj cp'yj tgg'uki o c'VRW0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r rg'ugv'tgs wktgf 'tgr tgr 'qt'tgcpcn'uku0"

"

Recounts"

Uco r ngu'65: 727224*ECO Q/3: /36: 299+cpf '65: 727233*ECO Q/3: /36: 2: 2+y gtg'tgeqwpvgf 'f wg'vq'c'r gcm uj k0Vj g'tgeqwpw'ctg'tgr qtvgf 0Uco r rg'3425; 49; 52*O D+y cu'i kxgp'cf f k'kqpcn'engcp/wr 'ungr u'cpf 'tgeqwpvgf 'lp qtf gt'vq'ko r tqxg'yj g'tguqwnkqp0Vj g'tgeqwpv'ku'tgr qtvgf 0"

Miscellaneous Information:"

"

Manual Integration"

P q'o cpwcnl'pvgi tcwqpu'y gtg'r gthqto gf 'qp'f c'c'lp'yj ku'dcvej 0"

"

Sample-Specific MDA/MDC"

Vj g'O F C IO F E'tgr qtvgf 'qp'yj g'egt w'hecvg'qh'cpcn'uku'ku'c'uco r rg/ur gekhe'O F C IO F E0"

"

Additional Comments"

Vj g'O gvj qf 'drpnm'3425; 49; 52*O D+'f kf 'pqv'cej l'xg'622'tcegt'eqwpw=f qy gxgt.'vj g'en'egpv'tcegt'f lgrf tgeqxtg'f'tgs wktgo gpw'cpf 'f g'vewqp'hko ku'y gtg'o gv0"

Qualifier Information"

"

O cpwcn'wcn'ltu'y gtg'pqv'tgs wktgf 0"

"
"
"

Method/Analysis Information"

"

Product: **Gammaspec**

Cpcn\ \ecni'O gj qf <" GRC< 230

Cpcn\ \ecni'Dvej 'P wo dgt<" 3943823

"

Sample ID ""Client ID

65: 727224" " ECO Q/3: /36: 299

65: 727228" ""ECO Q/3: /36: 29:

65: 72722: " ""ECO Q/3: /36: 29;

65: 727233" ""ECO Q/3: /36: 2: 2

3425; 4882: ""O gj qf 'Drcpni'O D+

3425; 48832""Ncdqtcvqt { 'Eqpvtqni'Uco r rg"%NEU+

3425; 4882; ""65: 727224*ECO Q/3: /36: 299+"Uco r rg'F w rdecvg"%F WR+

"

Vj g'uco r ngu'lp'yj ku'UF I 'y gtg'cpcn| gf "qp'cp'\$cu'tgegkxgf '\$dcuku0"

"

SOP Reference"

Rtqegf wtg'hqt'r tgr ctcvqp."cpcn\ uku'cpf 'tgr qt vpi 'qh'cpcn\ \ecn'f cvc'ctg'eqpvtqngf 'd { 'I GN'Ncdqtcvqtkgu'NNE'cu
Ucpf ctf 'Qr gtcvpi 'Rtqegf wtg"%UR+0Vj g'f cvc'f kuewugf 'lp'yj ku'pcttcvkg'j' cu'dggp'cpcn| gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/235'TGX%490"

Calibration Information:"

"

Calibration Information"

Cm'lpk'kcn'cpf 'eqpvtqngf 'ecndtcvqp'tgs wkt go gpw'j cxg'dggp'o gv0Vj g'lpk'kcn'Ecrndtcvqpuy gtg'r gthqto gf 'lp
Cwi wuv'4239.'Lwn\ '4239.'O ctej '4239.'O c { '4239'cpf 'Ugr vgo dgt'42390"

"

Standards Information"

Ucpf ctf "uqnvkpu'hqt'yj gug'cpcn\ uku'ctg'P KUV'tcegcdng'qt'xgtk'kgf'y kj "c'P KUV'tcegcdng'ucpf ctf "cpf "wugf
dghqtg'yj g'g'zr kcvqp'f cvgu0"

"

Sample Geometry"

Cm'eqpvtqngf 'uqwtgu'y gtg'r tgr ctcgf 'lp'yj g'uco g'i gqo gwt { "cu'yj g'ecndtcvqp'ucpf ctf u0"

Quality Control (QC) Information:"

"

Blank Information"

Vj g'drcpni'xqno g'ku'tgr tgu'pvc'kg'qh'yj g'uco r rg'xqno g'lp'yj ku'dvej 0"

"

Method Blank Criteria"

Vj g'O gj qf 'Drcpni'O D+"o gv'ceegr vpeg'etkgtkc0"

"

CSU"

Vj g'drcpni'tguwn/ku'ngu'yj cp'3087"ko gu'yj g'E UW0"

"

Blank Decision Level"

Vj g'dicpnit guwn'ku'iguu'vj cp'vj g'f gekukqp'igxgr0"

"

Laboratory Control Sample (LCS) Recovery"

Vj g'NEU'ur kng'tgeqxtgku'o gv'vj g'ceegr vpeg'iko ku0"

"

Designated QC"

Vj g'hmqy lpi 'uco r ng'y cu'wugf 'hqt'S E<65: 727224*ECO Q/3: /36: 299+0Vj g'S E'y cu'ltqo 'CTUN'y qtmqtf gt 65: 7270"

"

Duplication Criteria between QC Sample and Duplicate Sample"

Vj g'S E'Uco r ng'cpf 'F w rdecv'Uco r ng'*F WR+o gv'vj g'f w rdecv'qp'ceegr vpeg'etkgtk0"

"

RDL Met"

Vj g'o gvj qf 'TFN'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time"

Cml'uco r ng'r tqegf wtgu'hqt'vj ku'uco r ng'ugv'y gtg'r gthqto gf'y kj kp'vj g'tgs wktgf'j qrf lpi 'lko g0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'vj g'uco r ngu'lp'vj ku'uco r ng'ugv'tgs wktgf'tgr tgr 'qt'tgpcpn'uku0"

"

Recounts"

P qpg'qh'vj g'uco r ngu'lp'vj ku'uco r ng'ugv'y gtg'tgeqwpvgf 0"

Miscellaneous Information:"

"

Sample-Specific MDA/MDC"

Vj g'O F C I O F E'tgr qtvgf 'qp'vj g'egt v'w rdecv'qh'cpcn'uku'ku'c'uco r ng'ur g'elhe'O F C I O F E0"

"

Additional Comments"

Cf fklqpcn'eqo o gpw'y gtg'pqv'tgs wktgf'hqt'vj ku'uco r ng'ugv0"

Qualifier Information"

"

Qualifier	Reason	Analyte	Sample	Client Sample
WK	T guwmu'ctg eqpukf gtgf 'c'hcnug r quklxg'f vg'vq'j ki j eqwpv'pi " wpegtvclpv'0	Rqvcuukwo /62	65: 72722:	ECO Q/3: /36: 29;
WK	T guwmu'ctg eqpukf gtgf 'c'hcnug r quklxg'f vg'vq'j ki j " r gcn'y kf vj 0		3425; 4882;	ECO Q/3: /36: 299*65: 727224F WR+

"

"

"

"

Method/Analysis Information"

"

Product: WSP-GrossA/B

Cpcn\vecn\O gj qf < GRC", 22Ø IUY : 68"; 532

Cpcn\vecn\Devej 'P wo dgt< 3944; 99

"

Sample ID "" Client ID

65: 727224" "" ECO Q/3: /36: 299

65: 727228" "" ECO Q/3: /36: 29:

65: 72722: " "" ECO Q/3: /36: 29;

65: 727233" "" ECO Q/3: /36: 2: 2

3425; 52283"" O gj qf 'Drcpmi*O D+

3425; 52287"" Ncdqtcvqt { 'Eqpvtqnl'Uco r rg'*NEU+

3425; 52284"" 65: 727228*ECO Q/3: /36: 29: +'Uco r rg'F wr nlecvg'*F WR+

3425; 52285"" 65: 727228*ECO Q/3: /36: 29: +'O ctkz'Ur lng'*O U+

3425; 52286"" 65: 727228*ECO Q/3: /36: 29: +'O ctkz'Ur lng'F wr nlecvg'*O UF+

"

Vj g'uco r ngu'lp'yj ku'UF I 'y gtg'cpcn| gf "qp'cp'\$cu'tgeglxgf '\$dcuk0"

"

SOP Reference"

Rtqegf wtg'hqt'r tgr ctcvkqp.'cpcn\uku'cpf'tgr qt vpi 'qh'cpcn\vecn'f cwc'tg'eqpvtqngf'd { 'I GN'Ncdqtcvqtkgu'NNE'cu
Ucpf ctf 'Qr gtcvkpi 'Rtqegf wtg'*UQR+ØVj g'f cwc'f luewuugf 'lp'yj ku'pcttcvkxg'j cu'dggp'cpcn| gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/223'TGX%3; 0"

Calibration Information:"

"

Calibration Information"

Cmlpkkcni'cpf'eqpvpkpi 'ecrldtcvkp'tgs wktgo gpw'j cxg'dggp'o gØVj g'lpkkcni'Ecrldtcvkp'y cu'r gthqto gf 'lp
F gego dgt'42390"

"

Standards Information"

Ucpf ctf 'uqmwkpu'hqt'yj gug'cpcn\uku'ctg'P KUV'tcegcdng'qt'xgtkhgf'y kj "c'P KUV'tcegcdng'u'cpf ctf "wugf
dghqtg'yj g'gizr kcvkqp'f cvu0"

"

Sample Geometry"

Cml'eqwvki 'uqwegu'y gtg'r tgr ctgf 'lp'yj g'uco g'i gqo gw { 'cu'yj g'ecrldtcvkp'u'cpf ctf u0"

Quality Control (QC) Information:"

"

Blank Information"

Crls wqu'hqt'uco r ngu'3425; 52283*O D+cpf'3425; 52287*NEU+y gtg'ej cpi gf 'q'3Ø'r gt'erlcpv'tgs wgu0"

"

Method Blank Criteria"

Vj g'O gj qf 'Drcpmi*O D+o gv'ceegr wpeg'etkgtkc0"

"

CSU"

Vj g'drcpnltguwn'ku'hguu'yj cp'3Ø7'ko gu'yj g'E UW0"

"

Blank Decision Level"

Vj g'drcpnltguwn'ku'hguu'yj cp'yj g'f gekukp'hxgr0"

"

Laboratory Control Sample (LCS) Recovery"

Vj g'NEU'ur lng'tgeqxgtkgu'o gv'yj g'ceegr wpeg'iko ku0"

"

Designated QC"

Vj g'hqmqy lpi 'uco r ng'y cu'wugf 'hqt'S E<65: 727228*ECO Q/3: /36: 29: +0Vj g'S E'y cu'ltqo 'CTUN'y qtmqtf gt 65: 7270"

"

Matrix Spike (MS) Recovery"

Vj g'O U'lr kng'tgeqxtkgu'o gv'ceegr vpeg'rko ku0"

"

Duplication Criteria between MS and MSD"

Vj g'O ctkz'Ur kng'*O U'cpf 'O ctkz'Ur kng'F wr decvg'*O UF +o gv'j g'f wr decvqp'ceegr vpeg'etkgtkc0"

"

Duplication Criteria between QC Sample and Duplicate Sample"

Vj g'S E'Uco r ng'cpf 'F wr decvg'Uco r ng'*F WR+o gv'j g'f wr decvqp'ceegr vpeg'etkgtkc0"

"

RDL Met"

Vj g'o gvj qf 'TFN'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time"

Cmluco r ng'r tqegf wtgu'hqt'y ku'uco r ng'ugv'y gtg'r gthqto gf'y kj kp'y g'tgs wktgf'j qrf lpi 'lko g0"

"

Negative > 3 sigma TPU"

Uco r ngu'tguwnu'ctg'pqv'o qtg'pgi cvkxg'y cp'yj tgg'uki o c'VRW0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r ng'ugv'tgs wktgf'tgr tgr 'qt'tgpcpn(uku0"

"

Gross Alpha/Beta Preparation Information"

J ki j 'j { i tqueqr le'ucn'eqpvpgv'lp'gxcrtcvgf 'uco r ngu'ecp'ecwug'yj g'uco r ng'o cuu'vq'hwewwv'f wg'vq'o qkuwtg cduqtr vqp0Vq'o lpio k g'yj ku'lpvthtgpeg.'yj g'ucnu'ctg'eqpxgtvgf 'vq'qzkl gu'd{ 'j gcvlpi 'yj g'uco r ng'wpf gt'c'hwco g wvkl'c'f wntgf 'eqm'ku'qdvclpgf 0Vj g'eqpxgtukqp'vq'qzkl gu'ucdkl' gu'yj g'uco r ng'y gli j v'cpf 'gpuwtgu'yj cv'r tqr gt crj c ldgc'gh'ekpekgu'ctg'cuuki pgf 'hqt'gcej 'uco r ng'0Xqrcv'g' tcf kqkqqr gu'qh'ectdqp.'j { f tqi gp.'vgej pgvwo . r qmqkwo 'cpf 'egukwo 'o c{ 'dg'hqu'f wt lpi 'uco r ng'j gcvlpi .'gur gekm' 'vq'c'f wntgf 'j gcv0Hqt'yj ku'uco r ng'ugv'yj g r tgr ctgf 'r rpej gv'y cu'eqwpgf 'hqt'dgv'cevkl' 'dghqtg'dgkpi 'hwco gf 0Chgt'hwco lpi .'yj g'r rpej gv'y cu'eqwpgf 'hqt crj c'cevkl'0"

"

Recounts"

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r ng'ugv'y gtg'tgeqwpvgf 0"

Miscellaneous Information:"

"

Sample-Specific MDA/MDC"

Vj g'O F C I O F E'tgr qtvgf 'qp'yj g'egt v'hwecv'qh'cpcn(uku'ku'c'uco r ng'ur gekm'he'O F C I O F E0"

"

Additional Comments"

Vj g'o ctkz'ur kng'cpf 'o ctkz'ur kng'f wr decvg.'3425; 52285*ECO Q/3: /36: 29: O U'cpf '3425; 52286 *ECO Q/3: /36: 29: O UF +.'crks wqwi'y gtg'tgf wegf 'vq'eqpugt'xg'uco r ng'xqmw g0"

Qualifier Information"

"

O cpwn's wntgu'y gtg'pqv'tgs wktgf 0"

"

"

"

Method/Analysis Information"

"

Product: GFPC, Sr90, liquid

Cpcn\vecn\O gj qf < GRC< 270

Cpcn\vecn\Devej 'P wo dgt< 39455: 5

"

Sample ID ""Client ID

65: 727224" " ECO Q/3: /36: 299

65: 727228" ""ECO Q/3: /36: 29:

65: 72722: " ""ECO Q/3: /36: 29;

65: 727233" ""ECO Q/3: /36: 2: 2

3425; 53339""O gj qf 'Drcpm\O D+

3425; 53342""Ncdqtcvt { 'Eqpvtqn\Uco r rg*NEU+

3425; 5333: ""65: 727233*ECO Q/3: /36: 2: 2+Uco r rg\F wr decvg\F WR+

3425; 5333; ""65: 727233*ECO Q/3: /36: 2: 2+O cvtk\Ur kng*O U+

"

Vj g'uco r ngu\p'yj ku\UF I 'y gtg'cpcn\| gf "qp"cp"\$cu'tgegxgf \$"dcuku0"

"

SOP Reference""

Rtqegf wtg'hqt'r tgr ctcvkp."cpcn\uku\cpf 'tgr qt vpi "qh'cpcn\vecn\fcv'ctg'eqpvtqmgf 'd { 'I GN'Ncdqtcvtkgu'NNE'cu
Ucpf ctf "Qr gtcvpi 'Rtqegf wtg*UR+0Vj g'f cv'f kuewugf 'lp'yj ku'pcttcvkxg'j cu'dggp'cpcn\| gf 'lp'ceeqtf cpeg'y kj
I N/TCF/C/226'TGX%3; 0"

Calibration Information:"

"

Calibration Information""

Cml\pkkn\cpf "eqp\pvpki "ecr\dcvkp'tgs wtkgo gpw\j cxg'dggp'o g0Vj g'lp\kn\Ecr\dcvkp'y cu'r gthqto gf 'lp'Cr tln
42380"

"

Standards Information""

Ucpf ctf "uqn\wkp'u'hqt'yj gug'cpcn\uku\ctg'P KUV'tcegcdng'qt'xgtkhgf "y kj "c'P KUV'tcegcdng'uvcpf ctf "cpf "wugf
dghqtg'yj g'gzi kcvkp'f cvu0"

"

Sample Geometry""

Cml\eqw\pki "uqtegu'y gtg'r tgr ctgf "lp'yj g'uco g'i gqo gwt { "cu'yj g'ecr\dcvkp'uvcpf ctf u0"

Quality Control (QC) Information:"

"

Blank Information""

Crls wqu'hqt'uco r ngu'3425; 53339*O D+cpf '3425; 53342*NEU+y gtg'ej cpi gf "q'302'r gt'enlcpv'tgs wgu0"

"

Method Blank Criteria""

Vj g'O gj qf 'Drcpm\O D+o gv'ceegr vpeg'etkgtk0"

"

CSU""

Vj g'drcpnlt guw\ku'guu'yj cp'3087\ko gu'yj g'E UW0"

"

Blank Decision Level""

Vj g'drcpnlt guw\ku'guu'yj cp'yj g'f gekukp'rgxgr0"

"

Tracer/Carrier Yield "

Cm{lgrf u'o gv'vj g'tgs wktgf "ceegr vpeg'rko ku0"

"

Laboratory Control Sample (LCS) Recovery"

Vj g'NEU'ur kng'tgeqxtlgu'o gv'vj g'ceegr vpeg'rko ku0"

"

Designated QC"

Vj g'hqmqy lpi 'uco r ng'y cu'wugf 'hqt'S E<65: 727233*ECO Q/3: /36: 2: 2+0Vj g'S E'y cu'ltqo 'CTUN'y qtmqtf gt 65: 7270"

"

Matrix Spike (MS) Recovery"

Vj g'O U'ur kng'tgeqxtlgu'o gv'ceegr vpeg'rko ku0"

"

Duplication Criteria between QC Sample and Duplicate Sample"

Vj g'S E'Uco r ng'cpf 'F w rdecvg'Uco r ng'*F WR+o gv'vj g'f w rdecvqp"ceegr vpeg'etkgtkc0"

"

RDL Met"

Vj g'o gvj qf 'TFN'j cu'dggp'o gv0"

Technical Information:"

"

Holding Time"

Cm'uco r ng'r tqegf wgu'hqt'vj ku'uco r ng'ugv'y gtg'r gthqto gf 'y kj kp'vj g'tgs wktgf 'j qrf lpi 'lko g0"

"

Negative > 3 sigma TPU"

Uco r ngu'tguwmu'ctg'pqv'o qtg'pgi cvkxg'vj cp'vj tgg'uki o c'VRW0"

"

Sample Re-prep/Re-analysis"

P qpg'qh'vj g'uco r ngu'lp'vj ku'uco r ng'ugv'tgs wktgf 'tgr tgr "qt'tgcpcn(uku0"

"

Recounts"

P qpg'qh'vj g'uco r ngu'lp'vj ku'uco r ng'ugv'y gtg'tgeqwpvgf 0"

Miscellaneous Information:"

"

Sample-Specific MDA/MDC"

Vj g'O F C I O F E'tgr qtvgf "qp'vj g'egt wkecvg'qh'cpcn(uku'ku'c'uco r ng/ur gekhe'O F C I O F E0"

"

Additional Comments"

Vj g'o ctkz'ur kng.'3425; 5333; *ECO Q/3: /36: 2: 20 U+.'cnk wqv'y cu'tgf wegf 'vq'eqpugt'xg'uco r ng'xqmw g0"

Qualifier Information"

"

O cpwcn's wcn'htu'y gtg'pqv'tgs wktgf 0"

"

"

"

Certification Statement"

"

Y j gtg'vj g'cpcn(vcnrlo gvj qf 'j cu'dggp'r gthqto gf 'wpgf gt 'P GNCR'egt wkecvqp.'vj g'cpcn(uku'j cu'o gv'cm'qh'vj g tgs wktgo gpw'qh'vj g'P GNCE'ucpf ctf 'wpguu'qvj gty kug'pqvgf 'lp'vj g'cpcn(vcnrlecug'pcttcvkg0"

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Qualifier Definition Report for

CTUN226"CTU"Kpvgtpcvkpcn"NNE"CTU/NCP U/O VQC8/472; 5/I GN+
Enkpv"UFI <423: /325: "I GN"Y qtmQtf gt<65: 727

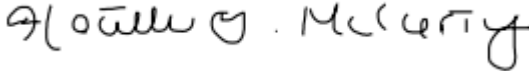
The Qualifiers in this report are defined as follows:

, ""C"s wcrk\ "eqpvtqn\cpcn\ vg'tgeqxtg\ { 'ku'qwukf g'qh'ur gekkfg "ceegr vpeg'etkgtlc
, , ""Cpcn\ vg'ku'c"Vtcegt'eqo r qwpf
W""Cpcn\ vg'y cu'cpcn\ | gf 'hqt."dw'pqv'f gvgevgf "cdqyg'y g'O F N.'O F C.'O F E'qt'NQF 0
WK""I co o c"Ur gev queqr { //Wpegtvcp'kf gpwhecvkqp"

Review/Validation

I GN'tgs wktgu'cm\cpcn\ vcecnf cvc'vq'dg'xgtkkfg "d\ { "c"s wcrk\kf "f cvc'tgxky gt0"kp'cf f kkkp."cm\ENR/rkng'f grkxgtcdngu
tgegkxg"v'j kf "rgxgn'tgxky "qh'v'j g'frcvkcpcn\f cvc'r centi g0"

Vj g'hqmgy lpi "f cvc'xcrkf cvqt'xgtkkfg "v'j g'lphqto cvkqp'r tguvpgf "kp'v'j ku'f cvc'tgr qtv<

Signature: 

Name: Heather McCarty

Date: 18 DEC 2017

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Report Date: December 18, 2017

Client Sample ID: CAMO-18-148077
Sample ID: 438505002
Matrix: W
Collect Date: 20-NOV-17
Receive Date: 22-NOV-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00689	+/-0.00608	0.0409	0.0173	+/-0.00609	0.050	pCi/L			MXS2	12/04/17	1357	1722107	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00652	+/-0.00721	0.032	0.0131	+/-0.00721	0.050	pCi/L			MXS2	12/04/17	1357	1722108	2
Plutonium-239/240	U	0.00217	+/-0.00841	0.0458	0.020	+/-0.00841	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.363	+/-0.0312	0.119	0.0562	+/-0.0358	1.00	pCi/L			MXS2	12/07/17	1339	1722109	3
Uranium-235/236		0.0768	+/-0.0162	0.0514	0.0217	+/-0.0166	1.00	pCi/L							
Uranium-238		0.172	+/-0.0219	0.0696	0.0316	+/-0.0234	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.115	+/-1.18	4.36	1.94	+/-1.18	8.00	pCi/L			BSW1	11/30/17	0738	1721601	4
Cobalt-60	U	0.268	+/-0.999	4.19	1.73	+/-1.00	8.00	pCi/L							
Neptunium-237	U	0.896	+/-2.15	8.10	3.73	+/-2.16		pCi/L							
Potassium-40	U	22.0	+/-16.2	68.1	30.4	+/-17.0		pCi/L							
Sodium-22	U	-0.509	+/-0.918	3.56	1.43	+/-0.926		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.0922	+/-0.132	0.479	0.223	+/-0.132	0.500	pCi/L			KSD1	12/09/17	1726	1723383	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	1.27	+/-0.680	2.17	0.933	+/-0.689	3.00	pCi/L			AXH4	12/06/17	1101	1722977	6
Alpha		2.83	+/-0.934	2.31	0.825	+/-0.964	3.00	pCi/L			AXH4	12/06/17	1530	1722977	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer	Alphaspec Am241 Liquid "As Received"	1722107	76.8	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1722108	79	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1722109	73.3	(50%-105%)

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Certificate of Analysis

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148077

Sample ID: 438505002

Project: ESHL00114

Client ID: ARSL004

Report Date: December 18, 2017

Parameter	Qualifier	Result Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Strontium Carrier		GFPC, Sr90, liquid "As Received"						1723383	81.5	(50%-105%)				

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148078

Sample ID: 438505006

Matrix: W

Collect Date: 20-NOV-17

Receive Date: 22-NOV-17

Collector: Client

Report Date: December 18, 2017

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00373	+/-0.00645	0.0332	0.0141	+/-0.00646	0.050	pCi/L			MXS2	12/04/17	1357	1722107	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00	+/-0.00854	0.0364	0.0148	+/-0.00854	0.050	pCi/L			MXS2	12/04/17	1357	1722108	2
Plutonium-239/240	U	-0.00247	+/-0.0118	0.052	0.0226	+/-0.0118	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.450	+/-0.0448	0.195	0.092	+/-0.0509	1.00	pCi/L			MXS2	12/04/17	1549	1722109	3
Uranium-235/236		0.087	+/-0.0227	0.0842	0.0355	+/-0.0232	1.00	pCi/L							
Uranium-238		0.262	+/-0.0334	0.114	0.0517	+/-0.0363	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-0.709	+/-1.39	5.01	2.16	+/-1.40	8.00	pCi/L			BSW1	11/30/17	0739	1721601	4
Cobalt-60	U	2.39	+/-1.47	6.91	2.92	+/-1.57	8.00	pCi/L							
Neptunium-237	U	-0.54	+/-2.81	9.50	4.34	+/-2.81		pCi/L							
Potassium-40	U	-4.41	+/-21.7	84.3	36.7	+/-21.7		pCi/L							
Sodium-22	U	-1.76	+/-1.35	4.64	1.80	+/-1.41		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.31	+/-0.106	0.482	0.214	+/-0.106	0.500	pCi/L			KSD1	12/09/17	1726	1723383	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		2.36	+/-0.729	2.06	0.875	+/-0.756	3.00	pCi/L			AXH4	12/06/17	1101	1722977	6
Alpha	U	0.535	+/-0.650	2.48	0.900	+/-0.651	3.00	pCi/L			AXH4	12/06/17	1530	1722977	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1722107	101	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1722108	70.3	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1722109	65.2	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1723383	68.8	(50%-105%)

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Certificate of Analysis

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148078

Sample ID: 438505006

Project: ESHL00114

Client ID: ARSL004

Report Date: December 18, 2017

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148079

Sample ID: 438505008

Matrix: W

Collect Date: 20-NOV-17

Receive Date: 22-NOV-17

Collector: Client

Report Date: December 18, 2017

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis															
<i>Alphaspec Am241 Liquid "As Received"</i>															
Americium-241	U	0.00	+/-0.00904	0.043	0.0182	+/-0.00904	0.050	pCi/L			MXS2	12/04/17	1357	1722107	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00833	+/-0.00659	0.0307	0.0125	+/-0.0066	0.050	pCi/L			MXS2	12/04/17	1357	1722108	2
Plutonium-239/240	U	0.0146	+/-0.00859	0.0439	0.0191	+/-0.00861	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.574	+/-0.0476	0.179	0.0844	+/-0.0565	1.00	pCi/L			MXS2	12/04/17	1549	1722109	3
Uranium-235/236		0.133	+/-0.0259	0.0773	0.0326	+/-0.0268	1.00	pCi/L							
Uranium-238		0.327	+/-0.035	0.105	0.0474	+/-0.039	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	0.155	+/-1.06	4.11	1.75	+/-1.06	8.00	pCi/L			BSW1	11/30/17	0744	1721601	4
Cobalt-60	U	0.178	+/-1.17	4.92	1.99	+/-1.17	8.00	pCi/L							
Neptunium-237	U	7.51	+/-3.13	12.5	5.82	+/-3.59		pCi/L							
Potassium-40	UI	48.2	+/-28.3	48.1	19.4	+/-28.4		pCi/L							
Sodium-22	U	0.288	+/-1.14	4.85	1.97	+/-1.14		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.208	+/-0.130	0.488	0.228	+/-0.130	0.500	pCi/L			KSD1	12/09/17	1727	1723383	5
<i>WSP-GrossA/B "As Received"</i>															
Beta	U	2.24	+/-0.772	2.24	0.964	+/-0.797	3.00	pCi/L			AXH4	12/06/17	1102	1722977	6
Alpha	U	2.10	+/-0.948	2.85	1.11	+/-0.965	3.00	pCi/L			AXH4	12/06/17	1530	1722977	7

The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1722107	70	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1722108	79.5	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1722109	72.3	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1723383	84.1	(50%-105%)

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Certificate of Analysis

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Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148079

Sample ID: 438505008

Project: ESHL00114

Client ID: ARSL004

Report Date: December 18, 2017

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148080

Sample ID: 438505011

Matrix: W

Collect Date: 20-NOV-17

Receive Date: 22-NOV-17

Collector: Client

Report Date: December 18, 2017

Project: ESHL00114

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
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Rad Alpha Spec Analysis

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.00649	+/-0.0078	0.0385	0.0163	+/-0.0078	0.050	pCi/L			MXS2	12/04/17	1357	1722107	1
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ISOPU "As Received"

Plutonium-238	U	0.00601	+/-0.011	0.0339	0.0143	+/-0.011	0.050	pCi/L			MXS2	12/09/17	1439	1722108	2
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Plutonium-239/240	U	0.00986	+/-0.0103	0.049	0.0219	+/-0.0103	0.050	pCi/L							
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IsoU "As Received"

Uranium-234		0.738	+/-0.0447	0.131	0.0618	+/-0.0576	1.00	pCi/L			MXS2	12/07/17	1339	1722109	3
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Uranium-235/236		0.123	+/-0.0215	0.0566	0.0239	+/-0.0224	1.00	pCi/L							
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Uranium-238		0.339	+/-0.031	0.0765	0.0347	+/-0.0352	0.500	pCi/L							
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Rad Gamma Spec Analysis

GammaSpec "As Received"

Cesium-137	U	-0.429	+/-1.17	4.12	1.84	+/-1.17	8.00	pCi/L			BSW1	11/30/17	0744	1721601	4
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Cobalt-60	U	-0.588	+/-1.07	3.94	1.65	+/-1.08	8.00	pCi/L							
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Neptunium-237	U	-0.951	+/-1.89	6.89	3.16	+/-1.90		pCi/L							
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Potassium-40	U	-17.9	+/-14.7	51.8	22.6	+/-15.3		pCi/L							
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Sodium-22	U	-0.139	+/-1.15	3.87	1.62	+/-1.15		pCi/L							
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	-0.0943	+/-0.112	0.467	0.200	+/-0.112	0.500	pCi/L			KSD1	12/09/17	1727	1723383	5
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WSP-GrossA/B "As Received"

Beta	U	1.70	+/-0.676	2.03	0.860	+/-0.692	3.00	pCi/L			AXH4	12/06/17	1102	1722977	6
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Alpha		2.84	+/-1.06	2.76	0.974	+/-1.09	3.00	pCi/L			AXH4	12/06/17	1530	1722977	7
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The following Analytical Methods were performed

Method	Description
1	HASL-300:AM-241
2	HASL-300:ISOPU
3	HASL-300:ISOU
4	EPA:901.1
5	EPA:905.0
6	EPA 900.0/SW846 9310
7	EPA 900.0/SW846 9310

Surrogate/Tracer	Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Americium-243 Tracer		Alphaspec Am241 Liquid "As Received"	1722107	85.1	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1722108	39.9	* (50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1722109	67.7	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1723383	82.8	(50%-105%)

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Contact: Ms. Nita Patel

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-148080

Sample ID: 438505011

Project: ESHL00114

Client ID: ARSL004

Report Date: December 18, 2017

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test											Batch ID	Recovery%	Acceptable Limits	

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

Lc/LC: Critical Level

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Mtd.: Method

PF: Prep Factor

RL: Reporting Limit

TPU: Total Propagated Uncertainty

Quality Control Summary

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QC Summary

Report Date: December 18, 2017

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Client : Los Alamos National Laboratory
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 438505

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1722107										
QC1203927925	438505002	DUP									
Americium-241	U	0.00689	U	0.00975	pCi/L	0.109		(0-1)	MXS2	12/04/17	13:57
	Uncert:	+/-0.00608		+/-0.00703							
	TPU:	+/-0.00609		+/-0.00704							
**Americium-243 Tracer	2.62	2.01		2.18	pCi/L		83	(50%-105%)			
	Uncert:	+/-0.0774		+/-0.0713							
	TPU:	+/-0.140		+/-0.134							
QC1203927926	LCS										
Americium-241	1.97			1.90	pCi/L		96.6	(80%-120%)	MXS2	12/04/17	13:57
	Uncert:			+/-0.0592							
	TPU:			+/-0.103							
**Americium-243 Tracer	2.10			1.95	pCi/L		93	(50%-105%)			
	Uncert:			+/-0.0612							
	TPU:			+/-0.112							
QC1203927924	MB										
Americium-241			U	0.00659	pCi/L				MXS2	12/04/17	13:57
	Uncert:			+/-0.00616							
	TPU:			+/-0.00617							
**Americium-243 Tracer	2.10			1.81	pCi/L		86.2	(50%-105%)			
	Uncert:			+/-0.0587							
	TPU:			+/-0.109							
Batch	1722108										
QC1203927928	438505002	DUP									
Plutonium-238	U	0.00652	U	0.0142	pCi/L	0.29		(0-1)	MXS2	12/04/17	16:37
	Uncert:	+/-0.00721		+/-0.0061							
	TPU:	+/-0.00721		+/-0.00613							
Plutonium-239/240	U	0.00217	U	0.00407	pCi/L	0.0639		(0-1)			
	Uncert:	+/-0.00841		+/-0.00643							
	TPU:	+/-0.00841		+/-0.00644							
**Plutonium-242 Tracer	2.47	1.95		2.00	pCi/L		81.3	(50%-105%)			
	Uncert:	+/-0.0739		+/-0.071							
	TPU:	+/-0.125		+/-0.122							
QC1203927929	LCS										
Plutonium-238			U	-1.97E-09	pCi/L			(80%-120%)	MXS2	12/04/17	16:37
	Uncert:			+/-0.00628							
	TPU:			+/-0.00628							
Plutonium-239/240	1.98			1.88	pCi/L		95.3	(80%-120%)			
	Uncert:			+/-0.0532							
	TPU:			+/-0.0912							
**Plutonium-242 Tracer	1.97			1.64	pCi/L		83.3	(50%-105%)			
	Uncert:			+/-0.0543							
	TPU:			+/-0.0946							

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QC Summary

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Parname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1722108										
QC1203927927	MB										
Plutonium-238			U	0.00192	pCi/L				MXS2	12/04/17	16:37
				Uncert: +/-0.00694							
				TPU: +/-0.00694							
Plutonium-239/240			U	0.0077	pCi/L						
				Uncert: +/-0.00608							
				TPU: +/-0.00609							
**Plutonium-242 Tracer	1.97			1.48	pCi/L		74.8	(50%-105%)			
				Uncert: +/-0.062							
				TPU: +/-0.104							
Batch	1722109										
QC1203927931	438505002	DUP									
Uranium-234		0.363		0.349	pCi/L	0.0946		(0-1)	MXS2	12/04/17	15:49
		Uncert: +/-0.0312		+/-0.0356							
		TPU: +/-0.0358		+/-0.0398							
Uranium-235/236		0.0768		0.0902	pCi/L	0.178		(0-1)			
		Uncert: +/-0.0162		+/-0.0204							
		TPU: +/-0.0166		+/-0.0209							
Uranium-238		0.172		0.216	pCi/L	0.418		(0-1)			
		Uncert: +/-0.0219		+/-0.0265							
		TPU: +/-0.0234		+/-0.0287							
**Uranium-232 Tracer	2.62	1.92		1.77	pCi/L		67.5	(50%-105%)			
		Uncert: +/-0.0808		+/-0.0921							
		TPU: +/-0.150		+/-0.163							
QC1203927932	LCS										
Uranium-234				2.49	pCi/L				MXS2	12/04/17	15:49
		Uncert: +/-0.0725		+/-0.0725							
		TPU: +/-0.142		+/-0.142							
Uranium-235/236				0.219	pCi/L						
		Uncert: +/-0.0246		+/-0.0246							
		TPU: +/-0.0269		+/-0.0269							
Uranium-238	2.70			2.79	pCi/L		103	(80%-120%)			
		Uncert: +/-0.0764		+/-0.0764							
		TPU: +/-0.157		+/-0.157							
**Uranium-232 Tracer	2.09			1.73	pCi/L		82.8	(50%-105%)			
		Uncert: +/-0.0669		+/-0.0669							
		TPU: +/-0.123		+/-0.123							
QC1203927930	MB										
Uranium-234			U	0.0966	pCi/L				MXS2	12/11/17	17:07
		Uncert: +/-0.0271		+/-0.0271							
		TPU: +/-0.0278		+/-0.0278							
Uranium-235/236			U	0.0479	pCi/L						
		Uncert: +/-0.0196		+/-0.0196							
		TPU: +/-0.0199		+/-0.0199							
Uranium-238			U	0.0635	pCi/L						
		Uncert: +/-0.0214		+/-0.0214							
		TPU: +/-0.0218		+/-0.0218							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1722109										
**Uranium-232 Tracer	2.09			1.32	pCi/L		63	(50%-105%)			
	Uncert:			+/-0.109							
	TPU:			+/-0.173							
Rad Gamma Spec											
Batch	1721601										
QC1203926609	438505002	DUP									
Cesium-137	U	0.115	U	0.743	pCi/L	0.14		(0-1)	BSW1	11/30/1709:59	
	Uncert:	+/-1.18		+/-1.05							
	TPU:	+/-1.18		+/-1.06							
Cobalt-60	U	0.268	U	0.629	pCi/L	0.0854		(0-1)			
	Uncert:	+/-0.999		+/-1.10							
	TPU:	+/-1.00		+/-1.11							
Neptunium-237	U	0.896	U	-1.96	pCi/L	0.336		(0-1)			
	Uncert:	+/-2.15		+/-2.04							
	TPU:	+/-2.16		+/-2.09							
Potassium-40	U	22.0	UI	70.8	pCi/L	0.474		(0-1)			
	Uncert:	+/-16.2		+/-34.4							
	TPU:	+/-17.0		+/-34.6							
Sodium-22	U	-0.509	U	-0.755	pCi/L	0.0671		(0-1)			
	Uncert:	+/-0.918		+/-0.892							
	TPU:	+/-0.926		+/-0.909							
QC1203926610	LCS										
Americium-241	34300			39200	pCi/L		114	(80%-120%)	BSW1	11/30/1708:58	
	Uncert:			+/-589							
	TPU:			+/-1630							
Cesium-137	13000			13600	pCi/L		105	(80%-120%)			
	Uncert:			+/-162							
	TPU:			+/-590							
Cobalt-60	11200			11500	pCi/L		103	(80%-120%)			
	Uncert:			+/-167							
	TPU:			+/-550							
Neptunium-237			U	-34.1	pCi/L						
	Uncert:			+/-51.0							
	TPU:			+/-51.6							
Potassium-40			U	-6.94	pCi/L						
	Uncert:			+/-128							
	TPU:			+/-128							
Sodium-22			U	-10.5	pCi/L						
	Uncert:			+/-15.6							
	TPU:			+/-15.8							
QC1203926608	MB										
Cesium-137			U	0.879	pCi/L				BSW1	11/30/1707:45	
	Uncert:			+/-0.893							
	TPU:			+/-0.916							
Cobalt-60			U	0.882	pCi/L						
	Uncert:			+/-0.904							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1721601										
Neptunium-237	TPU:			+/-0.927							
			U	-1.09	pCi/L						
	Uncert:			+/-1.67							
Potassium-40	TPU:			+/-1.69							
			U	2.07	pCi/L						
	Uncert:			+/-16.5							
Sodium-22	TPU:			+/-16.5							
			U	1.38	pCi/L						
	Uncert:			+/-1.00							
	TPU:			+/-1.05							
Rad Gas Flow											
Batch	1722977										
QC1203930062	438505006	DUP									
Alpha	U	0.535	U	2.38	pCi/L	0.579		(0-1)	AXH4	12/06/17	15:30
	Uncert:	+/-0.650		+/-0.923							
	TPU:	+/-0.651		+/-0.945							
Beta		2.36		3.35	pCi/L	0.301		(0-1)		12/06/17	11:02
	Uncert:	+/-0.729		+/-0.835							
	TPU:	+/-0.756		+/-0.884							
QC1203930065	LCS										
Alpha	12.1			11.3	pCi/L		93.7	(80%-120%)	AXH4	12/06/17	15:30
	Uncert:			+/-0.573							
	TPU:			+/-1.10							
Beta	47.3			49.1	pCi/L		104	(80%-120%)		12/06/17	11:02
	Uncert:			+/-0.877							
	TPU:			+/-4.19							
QC1203930061	MB										
Alpha			U	-0.0329	pCi/L				AXH4	12/06/17	15:30
	Uncert:			+/-0.0865							
	TPU:			+/-0.0865							
Beta			U	-0.0528	pCi/L					12/06/17	11:02
	Uncert:			+/-0.101							
	TPU:			+/-0.101							
QC1203930063	438505006	MS									
Alpha	242	U	0.535	219	pCi/L		90.8	(75%-125%)	AXH4	12/06/17	15:30
	Uncert:		+/-0.650	+/-11.7							
	TPU:		+/-0.651	+/-22.2							
Beta	946		2.36	995	pCi/L		105	(75%-125%)		12/06/17	11:02
	Uncert:		+/-0.729	+/-18.7							
	TPU:		+/-0.756	+/-85.0							
QC1203930064	438505006	MSD									
Alpha	242	U	0.535	223	pCi/L	0.0418	92.3	(0-1)	AXH4	12/06/17	15:30
	Uncert:		+/-0.650	+/-11.6							
	TPU:		+/-0.651	+/-22.0							
Beta	946		2.36	979	pCi/L	0.0461	103	(0-1)		12/06/17	11:02
	Uncert:		+/-0.729	+/-18.0							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1722977										
Batch	1723383	TPU:	+/-0.756	+/-85.3							
QC1203931118	438505011	DUP									
Strontium-90		U	-0.0943	U	0.104	pCi/L	0.407	(0-1)	KSD1	12/09/17	17:27
		Uncert:	+/-0.112	+/-0.131							
		TPU:	+/-0.112	+/-0.131							
**Strontium Carrier		7.85	6.50	5.70	mg		72.6	(50%-105%)			
QC1203931120	LCS										
Strontium-90		23.7		19.9	pCi/L		83.9	(80%-120%)	KSD1	12/09/17	17:28
		Uncert:		+/-0.546							
		TPU:		+/-1.68							
**Strontium Carrier		7.85		7.10	mg		90.4	(50%-105%)			
QC1203931117	MB										
Strontium-90				U	0.0784	pCi/L			KSD1	12/09/17	17:27
		Uncert:		+/-0.0778							
		TPU:		+/-0.0781							
**Strontium Carrier		7.85		7.20	mg		91.7	(50%-105%)			
QC1203931119	438505011	MS									
Strontium-90		237	U	-0.0943	194	pCi/L	82	(75%-125%)	KSD1	12/09/17	17:28
		Uncert:		+/-0.112	+/-5.53						
		TPU:		+/-0.112	+/-17.0						
**Strontium Carrier		7.85	6.50	6.80	mg		86.6	(50%-105%)			

Notes:

TPU and Counting Uncertainty are calculated at the 68% confidence level (1-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Sample results are rejected

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
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.

** Indicates analyte is a surrogate/tracer compound.

^ 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.

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.