

The order of this data package is as follows:

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

Comments:

Revised data begins on page 315.

General Engineering Charleston SC		Chain of Custody/Analysis Request															COC/Lab Request #: 2018-584 Page 1 of 1						
Client Contact:		Lab Agreement #:			Site Name: Los Alamos National Laboratory															Rad Screening Info: LOCATION: NO Lab Reporting Limit Type: Method Detection Limit			
Project Number: ADEP		<div>Analysis Turnaround Time: 24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/> 7 Days - <input type="checkbox"/> 14 Days - <input type="checkbox"/> 21 Days - <input type="checkbox"/> 28 Days - <input checked="" type="checkbox"/></div>			MSGP-Hg	WSP-8260B-VOA	WSP-8270C-SVOA	WSP-All Metals	WSP-CN(T)	WSP-GENINORG+PerChlorate	WSP-GrossA/B	WSP-NH3+NO3/NO2+PO4	WSP-RAD	WSP-TKN+TOC									
Field Sample ID	Sample Date	Sample Time	Sample Matrix																				
CAPA-18-147550	Oct 25 2017	09:44	W				1		1		1												
CAPA-18-147576	Oct 25 2017	09:44	W	1	2	2		1		1		1	1										
CAPA-18-147606	Oct 25 2017	09:44	W		2																		
CAMO-18-147635	Oct 25 2017	13:50	W				1		1		1												
CAMO-18-147650	Oct 25 2017	13:50	W	1	2	2		1		1		1	1										
CAMO-18-147672	Oct 25 2017	13:50	W		2																		
CAMO-18-147678	Oct 25 2017	13:50	W		2	2																	
CAMO-18-147680	Oct 25 2017	13:50	W				1		1		1												
CAMO-18-147683	Oct 25 2017	13:50	W	1	2	2		1		1		1	1										
CAPA-18-147555	Oct 25 2017	11:51	W				1		1		1												
CAPA-18-147581	Oct 25 2017	11:51	W	1	2	2		1		1		1	1										
CAPA-18-147608	Oct 25 2017	11:51	W		2																		
Special Instructions:																							
Relinquished by: M. Engler				Print Name: MATT ENGLERT				Date/Time: 10-26-17 1500				Received by:				Print Name:				Date/Time:			
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:				Date/Time:			
Relinquished by:				Print Name:				Date/Time:				Received by:				Print Name:				Date/Time:			

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147550

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	0944		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-23		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time _____ HH:MM *Tv 10-25-17* Dissolved Oxygen _____ Flow (in gpm) _____
 Oxidation-Reduction Potential _____ pH _____ Specific Conductance _____
 Temperature _____ Turbidity _____

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) <i>Tanya VanderVice</i> (Signature) <i>Tanya VanderVice</i>	Date/Time 10-25-17 1235	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 10/25/17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147555

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1151		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-39		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) Tanya VanderVis	Date/Time 10-25-17 1235	RECEIVED BY MATT ENGLERT (Printed Name) M. Engler (Signature) M. Engler	Date/Time 10-25-17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147576

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	0944		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-23		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 ~40 ft. away

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	0944	HH:MM	Dissolved Oxygen	6.71 mg/L	Flow (in gpm)	11.11
Oxidation-Reduction Potential	241.9 mV		pH	8.00	Specific Conductance	168.4 μ S/cm
Temperature	21.0 °C		Turbidity	1.31 NTU		

COLLECTED BY (PRINT): D. Hughes

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAPA-18-147576**WORK ORDER:**

RELINQUISHED BY (Printed Name) Tanya VanderVis (Signature) <i>Tanya VanderVis</i>	Date/Time 10-25-17 1235	RECEIVED BY (Printed Name) <i>M. Montoya</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147581

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1151		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-39		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 ~30ft away

LOCATION COMMENTS: none

FIELD PARAMETERS:

Sample Time	1151	HH:MM	Dissolved Oxygen	5.66 mg/L	Flow (in gpm)	2.31
Oxidation-Reduction Potential	196.6mV		pH	6.80	Specific Conductance	138.
Temperature	19.7°C		Turbidity	2.10 NTU		

COLLECTED BY (PRINT): D Hughes

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAPA-18-147581**WORK ORDER:**

RELINQUISHED BY (Printed Name) Tanya VanderVij (Signature) <i>Tanya VanderVij</i>	Date/Time 10-25-17 1235	RECEIVED BY MATT ENGELT (Printed Name) (Signature) <i>M-Engel</i>	Date/Time 10-25-17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147606

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	0944		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-23		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 D04	HCL	Y	NA

SAMPLE COMMENTS:

10-24-17

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) Tanya Vanderhoff (Signature) Tanya Vanderhoff	Date/Time 10-25-17 1235	RECEIVED BY (Printed Name) M. M. M. M. (Signature) M. M. M. M.	Date/Time 10/25/17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAPA-18-147608

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10-25-17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1151		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-39		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 10/25/17	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) <i>Tanya VanderVis</i> (Signature) <i>Tanya VanderVis</i>	Date/Time 10-25-17 1235	RECEIVED BY <i>MATT ENGERT</i> (Printed Name) (Signature) <i>M. Engert</i>	Date/Time 10-25-17 1235
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147635

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1350	OK	MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	LSP	
LOCATION ID:	R-37 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- GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): T. Benham

RELINQUISHED BY (Printed Name) <i>Daniel Scarb</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500	RECEIVED BY (Printed Name) <i>M. Montan</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147650

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1350		MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	PSP GS 03-10-25-1	
LOCATION ID:	R-37 S1		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: None

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	NA	HH:MM	Dissolved Oxygen	1.77	Flow (in gpm)	.69
Oxidation-Reduction Potential	159.6		pH	8.37	Specific Conductance	235.7
Temperature	17.1		Turbidity	0.19		

COLLECTED BY (PRINT): T. Burhen

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAMO-18-147650**WORK ORDER:**

RELINQUISHED BY (Printed Name) <i>Donna Sorensen</i> (Signature) <i>[Signature]</i>	Date/Time <i>10/25/17</i> <i>1500</i>	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time <i>10/25/17</i> <i>1500</i>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147672

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	ck	FIELD MATRIX:	WG	ck
TIME COLLECTED (HH:MM):	1350	ck	MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-37 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	1 2 3 4 5	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): T. Bonham

RELINQUISHED BY (Printed Name) <i>Daniel J. Bonham</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500	RECEIVED BY (Printed Name) <i>M. Martinez</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147678

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1350	OK	MEDIA:		
PRS ID:	N		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-37 S1		FIELD PREP:	UF	
LOCATION TYPE:	N		FIELD QC TYPE:	FB	
TOP DEPTH:	↓		SAMPLE USAGE:	QC	↓
BOTTOM DEPTH:	↓		EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): D. Jaramila

RELINQUISHED BY (Printed Name) Daniel Jaramila (Signature) [Signature]	Date/Time 10/25/17 1500	RECEIVED BY (Printed Name) M. Montoya (Signature) [Signature]	Date/Time 10/25/17 1500
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147680

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1350	OK	MEDIA:		
PRS ID:	W		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-37 S1		FIELD PREP:	F	
LOCATION TYPE:	N		FIELD QC TYPE:	FD	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): T. Benham

RELINQUISHED BY (Printed Name) <i>Daniel Beran</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500	RECEIVED BY (Printed Name) <i>M. Monte</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1522
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11508

EVENT NAME: Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1

SAMPLE ID: CAMO-18-147683

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	10/25/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1350	OK	MEDIA:		
PRS ID:	NA		SAMPLE TECH CODE:	RSP	
LOCATION ID:	R-37 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FD	
TOP DEPTH:	1		SAMPLE USAGE:	QC	
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:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT): T. Bonham

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11508**EVENT NAME:** Pajarito (TA-54) & Chromium October
Monthly MY2018 Q1**SAMPLE ID:** CAMO-18-147683**WORK ORDER:**

RELINQUISHED BY (Printed Name) <i>Samuel Garcia</i> (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500	RECEIVED BY <i>M. Montoya</i> (Printed Name) (Signature) <i>[Signature]</i>	Date/Time 10/25/17 1500
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 10/05/2017

TEST - Explosives		YES	NO
Samples collected from a WFO area?			
Field Test for Explosives Results		YES	NO NA
Spot test shows presence of explosives residues. If YES - Do not ship.			

TEST - Chemical Preservation		YES	NO
Samples are chemically preserved?		X	
Field Team Member Statement		YES	NO NA
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?				
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO NA
Alpha detectable	Alpha >160,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		
Alpha > 125	Alpha >1,250,000	other locations		
Beta > 1,500	Beta >15,000,000	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?		X	
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO NA
<ul style="list-style-type: none"> Am-241 > 27 Cs-137 > 270 Pu-238 > 27 Pu-239/240 > 27 Th-228 > 27 U-234 > 270 U-238 > 270 H-3 > 27,000,000 	<ul style="list-style-type: none"> Am-241 > 270,000 Cs-137 > 270,000 Pu-238 > 270,000 Pu-239/240 > 270,000 Th-228 > 270,000 U-234 > 1,600,000,000 U-238 > unlimited H-3 > 27,000,000,000 		X
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	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.				
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.				

HOLD SAMPLES FOR ANALYSIS	
The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7]	

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) MATT ENGUERT	10-26-17
(Signature) <i>M. Enguert</i>	1500

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <i>Miss. Manja</i>	10/26/17
(Signature) <i>[Signature]</i>	300

DATA VALIDATION REPORT

Chain Of Custody No. 2018-584

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
439255	SW-846:8270D	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
439255	SW-846:8270D	1724120	1724119	1					1					1	1						

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8270D	SVOC	CAPA-18-147581	439255001	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203933006	LCS	0	6	76	0
SW-846:8270D	SVOC	LCSD	1203933007	LCSD	0	6	76	0
SW-846:8270D	SVOC	MB	1203933005	MB	80	6	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

DATA VALIDATION REPORT

6. Any surrogate recoveries outside the control limits?

No.

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

No.

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

None.

<u>Reason Code</u>	<u>Description</u>
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147581	R-39	REG	SW-846:8270D	0	80

DATA VALIDATION REPORT

Chain Of Custody No. 2018-584

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
436463	EPA:120.1	3	1			
436463	EPA:150.1	3	1			
436463	EPA:160.1	3	1			
436463	EPA:170.0	6	2	3	1	
436463	EPA:245.2	6	2			
436463	EPA:300.0	3	1			
436463	EPA:310.1	3	1			
436463	EPA:335.4	3	1			
436463	EPA:350.1	3	1			
436463	EPA:351.2	3	1			
436463	EPA:353.2	3	1			
436463	EPA:365.4	3	1			
436463	EPA:900	3	1			
436463	EPA:901.1	3	1			
436463	EPA:905.0	3	1			
436463	HASL-300:AM-241	3	1			
436463	HASL-300:ISOPU	3	1			
436463	HASL-300:ISOU	3	1			
436463	SM:A2340B	3	1			
436463	SW-846:6010C	3	1			
436463	SW-846:6020	3	1			
436463	SW-846:6850	3	1			
436463	SW-846:8260B	3	1	3	1	
436463	SW-846:8270D	3	1		1	
436463	SW-846:9060	3	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
436463	EPA:120.1	1714428	1714428	3	1									1				1			
436463	EPA:150.1	1715386	1715386	3	1									1				2			
436463	EPA:160.1	1714366	1714366	3	1				1					1				1			
436463	EPA:170.0	NA	NA	6	2	3	1														
436463	EPA:245.2	1718336	1718327	6	2				1	1				1				1			
436463	EPA:300.0	1715567	1715567	3	1				1					1				1			
436463	EPA:310.1	1715371	1715371	3	1					1				1				1			
436463	EPA:335.4	1713610	1713609	3	1				1	1				1				1			
436463	EPA:350.1	1714362	1714361	3	1				1	1				1				1			
436463	EPA:351.2	1714720	1714719	3	1				1	1				1				1			
436463	EPA:353.2	1714065	1714065	3	1				1					1				1			
436463	EPA:365.4	1714723	1714722	3	1				1	1				1				1			
436463	EPA:900	1716449	1716449	3	1				1	1	1			1				1			
436463	EPA:901.1	1716271	1716271	3	1				1					1				1			
436463	EPA:905.0	1714184	1714184	3	1				1	1				1				1			
436463	HASL-300:AM-241	1715443	1715443	3	1				1					1				1			
436463	HASL-300:ISOPU	1715444	1715444	3	1				1					1				1			
436463	HASL-300:ISOU	1715445	1715445	3	1				1					1				1			
436463	SM:A2340B	1721549	1721549	3	1																
436463	SW-846:6010C	1713802	1713801	3	1				1	1				1				1			
436463	SW-846:6020	1713852	1713851	3	1				1	1				1				1			
436463	SW-846:6850	1714762	1714758	3	1				1	1	1			1							
436463	SW-846:8260B	1716887	1716887	3	1	3	1		1					2							
436463	SW-846:8270D	1714633	1714631	3	1		1		1	1	1			1							
436463	SW-846:9060	1714357	1714357	3	1				1					1				1			

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-18-147558	1203908703	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203908702	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910984	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203910983	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	WT_SIP-17-148289	1203911838	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147550	1203910423	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203908512	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203908511	MB	1	0	0	0
EPA:170.0	VOC	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-147650	436463006	REG	1	0	0	0
EPA:170.0	VOC	CAMO-18-147672	436463008	FTB	1	0	0	0
EPA:170.0	VOC	CAMO-18-147678	436463009	FB	1	0	0	0
EPA:170.0	VOC	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:170.0	VOC	CAMO-18-147683	436463011	FD	1	0	0	0
EPA:170.0	VOC	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147576	436463002	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147581	436463014	REG	1	0	0	0
EPA:170.0	VOC	CAPA-18-147606	436463004	FTB	1	0	0	0
EPA:170.0	VOC	CAPA-18-147608	436463016	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147650	436463006	REG	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:245.2	INORGANIC	CAMO-18-147683	436463011	FD	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147550	1203918390	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147550	1203918391	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPA-18-147576	436463002	REG	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:245.2	INORGANIC	CAPA-18-147581	436463014	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203918389	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203918388	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-18-147570	1203911415	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203911414	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203911413	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910953	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-18-147567	1203910955	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203910950	LCS	0	0	1	0
EPA:335.4	INORGANIC	CAMO-18-147650	436463006	REG	1	0	0	0
EPA:335.4	INORGANIC	CAMO-18-147683	436463011	FD	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147576	1203906461	DUP	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147576	1203906463	MS	0	0	1	0
EPA:335.4	INORGANIC	CAPA-18-147576	436463002	REG	1	0	0	0
EPA:335.4	INORGANIC	CAPA-18-147581	436463014	REG	1	0	0	0
EPA:335.4	INORGANIC	LCS	1203906459	LCS	0	0	1	0
EPA:335.4	INORGANIC	MB	1203906458	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147558	1203908497	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-18-147558	1203908498	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203908496	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203908495	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147650	436463006	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-18-147683	436463011	FD	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147576	436463002	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147581	436463014	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147589	1203909430	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-18-147589	1203909431	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203909429	LCS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	MB	1203909428	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147551	1203907656	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203907655	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203907654	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147635	436463005	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-18-147680	436463010	FD	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147550	1203909440	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147550	1203909442	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147550	436463001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-18-147555	436463013	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203909437	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203909436	MB	1	0	0	0
EPA:900	RAD	CAMO-18-147650	436463006	REG	2	0	0	0
EPA:900	RAD	CAMO-18-147683	436463011	FD	2	0	0	0
EPA:900	RAD	CAPA-18-147576	436463002	REG	2	0	0	0
EPA:900	RAD	CAPA-18-147581	436463014	REG	2	0	0	0
EPA:900	RAD	CAPA-18-147631	1203913665	DUP	2	0	0	0
EPA:900	RAD	CAPA-18-147631	1203913666	MS	0	0	2	0
EPA:900	RAD	CAPA-18-147631	1203913667	MSD	0	0	2	0
EPA:900	RAD	LCS	1203913668	LCS	0	0	2	0
EPA:900	RAD	MB	1203913664	MB	2	0	0	0
EPA:901.1	RAD	CAMO-18-147650	436463006	REG	5	0	0	0
EPA:901.1	RAD	CAMO-18-147683	436463011	FD	5	0	0	0
EPA:901.1	RAD	CAPA-18-147576	1203913159	DUP	5	0	0	0
EPA:901.1	RAD	CAPA-18-147576	436463002	REG	5	0	0	0
EPA:901.1	RAD	CAPA-18-147581	436463014	REG	5	0	0	0
EPA:901.1	RAD	LCS	1203913160	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203913158	MB	5	0	0	0
EPA:905.0	RAD	CAMO-18-147650	436463006	REG	1	0	0	0
EPA:905.0	RAD	CAMO-18-147683	436463011	FD	1	0	0	0
EPA:905.0	RAD	CAPA-18-147574	1203907995	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-18-147574	1203907996	MS	0	0	1	0
EPA:905.0	RAD	CAPA-18-147576	436463002	REG	1	0	0	0
EPA:905.0	RAD	CAPA-18-147581	436463014	REG	1	0	0	0
EPA:905.0	RAD	LCS	1203907997	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203907994	MB	1	0	0	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
HASL-300:AM-241	RAD	CAMO-18-147650	436463006	REG	1	0	0	0
HASL-300:AM-241	RAD	CAMO-18-147683	436463011	FD	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147576	1203911097	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147576	436463002	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPA-18-147581	436463014	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203911098	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203911096	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-147650	436463006	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAMO-18-147683	436463011	FD	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147576	1203911100	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147576	436463002	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-18-147581	436463014	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203911101	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203911099	MB	2	0	0	0
HASL-300:ISOU	RAD	CAMO-18-147650	436463006	REG	3	0	0	0
HASL-300:ISOU	RAD	CAMO-18-147683	436463011	FD	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147576	1203911104	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147576	436463002	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPA-18-147581	436463014	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203911105	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203911103	MB	3	0	0	0
SM:A2340B	INORGANIC	CAMO-18-147635	436463005	REG	1	0	0	0
SM:A2340B	INORGANIC	CAMO-18-147680	436463010	FD	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147550	436463001	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPA-18-147555	436463013	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-147635	436463005	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAMO-18-147680	436463010	FD	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147550	1203906921	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147550	1203906922	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAPA-18-147550	436463001	REG	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-18-147555	436463013	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203906920	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203906919	MB	17	0	0	0
SW-846:6020	INORGANIC	CAMO-18-147635	436463005	REG	11	0	0	0
SW-846:6020	INORGANIC	CAMO-18-147680	436463010	FD	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147550	1203907099	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147550	1203907100	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-18-147550	436463001	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPA-18-147555	436463013	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203907098	LCS	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	MB	1203907097	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-147635	436463005	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-18-147680	436463010	FD	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147550	436463001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147551	1203909515	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147551	1203909516	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-18-147555	436463013	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203909514	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203909513	MB	1	0	0	0
SW-846:8260B	VOC	CAMO-18-147650	436463007	REG	80	3	0	0
SW-846:8260B	VOC	CAMO-18-147672	436463008	FTB	80	3	0	0
SW-846:8260B	VOC	CAMO-18-147678	436463009	FB	80	3	0	0
SW-846:8260B	VOC	CAMO-18-147683	436463012	FD	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147576	436463003	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147581	436463015	REG	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147606	436463004	FTB	80	3	0	0
SW-846:8260B	VOC	CAPA-18-147608	436463016	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203914645	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203914648	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203914644	MB	80	3	0	0
SW-846:8270D	SVOC	CAMO-18-147650	436463007	REG	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-147678	436463009	FB	80	6	0	0
SW-846:8270D	SVOC	CAMO-18-147683	436463012	FD	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-147576	1203909251	MS	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147576	1203909252	MSD	0	6	76	0
SW-846:8270D	SVOC	CAPA-18-147576	436463003	REG	80	6	0	0
SW-846:8270D	SVOC	CAPA-18-147581	436463015	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203909250	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203909249	MB	80	6	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-147650	436463006	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-18-147683	436463011	FD	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147576	436463002	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147578	1203908474	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-18-147581	436463014	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203908473	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203908472	MB	1	0	0	0

3. Are any analytes missing?

DATA VALIDATION REPORT

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203909436	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0207	J	mg/L	0.050
CAPA-18-147606	436463004	TRIP BLANK	EPA:170.0	W	Temperature	1		Deg C	
CAMO-18-147672	436463008	TRIP BLANK	EPA:170.0	W	Temperature	1		Deg C	
CAMO-18-147678	436463009	FIELD BLANK	EPA:170.0	W	Temperature	1		Deg C	
CAPA-18-147608	436463016	TRIP BLANK	EPA:170.0	W	Temperature	1		Deg C	

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAMO-18-147635	1203909436	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0207	mg/L	0.0297	J	0.050	Y	5	100	Y
CAMO-18-147680	1203909436	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0207	mg/L	0.0323	J	0.050	Y	5	100	Y
CAPA-18-147555	1203909436	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	0.0207	mg/L	0.0323	J	0.050	Y	5	100	Y

6. Any surrogate recoveries outside the control limits?

No.

DATA VALIDATION REPORT

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
CAPA-18-147589	1203909431		EPA:351.2	Total Kjeldahl Nitrogen	1714719	11-02-2017	W	111		110	90	10		

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

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
CAPA-18-147550	436463001	1203910423	EPA:160.1	Total Dissolved	W	156	170	mg/L	Y	Y	8.77	5
CAPA-18-147576	436463002	1203911104	HASL-300:ISOU	Uranium-234	W	0.442	0.292	pCi/L	Y	Y	41	20

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

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-37 S1	2018-584	CAMO-18-147635	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0297	mg/L	0.0297	mg/L			W	10/25/2017		1714723	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	-0.00827	pCi/L	-0.00827	pCi/L	0.0725	0.0117	W	10/25/2017		1715443	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-2.86	pCi/L	-2.86	pCi/L	4.17	1.33	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	1.68	pCi/L	1.68	pCi/L	4.49	0.892	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-1.48	pCi/L	-1.48	pCi/L	7.00	1.93	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	-0.00735	pCi/L	-0.00735	pCi/L	0.0542	0.00735	W	10/25/2017		1715444	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00735	pCi/L	-0.00735	pCi/L	0.0775	0.0147	W	10/25/2017		1715444	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:901.1	Potassium-40	UI	U	R5a	N	52.4	pCi/L	52.4	pCi/L	42.9	25.5	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-0.0427	pCi/L	-0.0427	pCi/L	4.75	1.21	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.188	pCi/L	0.188	pCi/L	0.428	0.128	W	10/25/2017		1714184	VAL	Y
R-37 S1	2018-584	CAMO-18-147650	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0633	pCi/L	0.0633	pCi/L	0.0891	0.0214	W	10/25/2017		1715445	VAL	Y
R-37 S1	2018-584	CAMO-18-147680	FD	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0323	mg/L	0.0323	mg/L			W	10/25/2017		1714723	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00248	pCi/L	0.00248	pCi/L	0.0435	0.00657	W	10/25/2017		1715443	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.534	pCi/L	-0.534	pCi/L	4.11	1.14	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.664	pCi/L	0.664	pCi/L	4.16	0.887	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	1.09	pCi/L	1.09	pCi/L	8.55	2.23	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.00387	pCi/L	0.00387	pCi/L	0.0571	0.0116	W	10/25/2017		1715444	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.0194	pCi/L	-0.0194	pCi/L	0.0816	0.0128	W	10/25/2017		1715444	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-7.04	pCi/L	-7.04	pCi/L	60.3	14.7	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.843	pCi/L	0.843	pCi/L	3.93	0.785	W	10/25/2017		1716271	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.309	pCi/L	0.309	pCi/L	0.450	0.142	W	10/25/2017		1714184	VAL	Y
R-37 S1	2018-584	CAMO-18-147683	FD	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.046	pCi/L	0.046	pCi/L	0.0828	0.0176	W	10/25/2017		1715445	VAL	Y
R-39	2018-584	CAPA-18-147555	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	J	U	I4	N	0.0323	mg/L	0.0323	mg/L			W	10/25/2017		1714723	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.00533	pCi/L	0.00533	pCi/L	0.0467	0.00653	W	10/25/2017		1715443	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.569	pCi/L	-0.569	pCi/L	4.08	1.26	W	10/25/2017		1716271	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-0.55	pCi/L	-0.55	pCi/L	6.06	1.57	W	10/25/2017		1716271	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	-0.691	pCi/L	-0.691	pCi/L	10.6	2.90	W	10/25/2017		1716271	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0041	pCi/L	0.0041	pCi/L	0.0604	0.0071	W	10/25/2017		1715444	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	0	pCi/L	0	pCi/L	0.0863	0.013	W	10/25/2017		1715444	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	6.14	pCi/L	6.14	pCi/L	54.5	24.3	W	10/25/2017		1716271	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	1.59	pCi/L	1.59	pCi/L	5.90	1.26	W	10/25/2017		1716271	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.249	pCi/L	-0.249	pCi/L	0.439	0.102	W	10/25/2017		1714184	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-23	2018-584	CAPA-18-147576	REG	INIT	RAD	HASL-300:ISOU	Uranium-234		J	R10	Y	0.442	pCi/L	0.442	pCi/L	0.0707	0.0414	W	10/25/2017		1715445	VAL	Y
R-23	2018-584	CAPA-18-147576	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0536	pCi/L	0.0536	pCi/L	0.0755	0.0198	W	10/25/2017		1715445	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0145	pCi/L	0.0145	pCi/L	0.0422	0.00762	W	10/25/2017		1715443	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-0.493	pCi/L	-0.493	pCi/L	4.11	1.16	W	10/25/2017		1716271	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	0.602	pCi/L	0.602	pCi/L	4.38	1.04	W	10/25/2017		1716271	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-0.0317	pCi/L	-0.0317	pCi/L	2.31	0.557	W	10/25/2017		1716449	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	2.75	pCi/L	2.75	pCi/L	9.07	2.33	W	10/25/2017		1716271	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0104	pCi/L	0.0104	pCi/L	0.0513	0.00921	W	10/25/2017		1715444	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00348	pCi/L	-0.00348	pCi/L	0.0733	0.00778	W	10/25/2017		1715444	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5a	N	39.5	pCi/L	39.5	pCi/L	32.4	21.3	W	10/25/2017		1716271	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	0.375	pCi/L	0.375	pCi/L	5.12	1.28	W	10/25/2017		1716271	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-0.08	pCi/L	-0.08	pCi/L	0.435	0.108	W	10/25/2017		1714184	VAL	Y
R-39	2018-584	CAPA-18-147581	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.031	pCi/L	0.031	pCi/L	0.0775	0.0163	W	10/25/2017		1715445	VAL	Y

Reason Code

Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample.
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.
U_LAB	The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-147635	R-37 S1	REG	EPA:120.1	0	1
CAMO-18-147635	R-37 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-18-147635	R-37 S1	REG	EPA:160.1	0	1
CAMO-18-147635	R-37 S1	REG	EPA:170.0	0	1
CAMO-18-147635	R-37 S1	REG	EPA:245.2	0	1
CAMO-18-147635	R-37 S1	REG	EPA:300.0	0	4
CAMO-18-147635	R-37 S1	REG	EPA:310.1	0	2
CAMO-18-147635	R-37 S1	REG	EPA:350.1	0	1
CAMO-18-147635	R-37 S1	REG	EPA:353.2	0	1
CAMO-18-147635	R-37 S1	REG	EPA:365.4	0	1
CAMO-18-147635	R-37 S1	REG	SM:A2340B	0	1
CAMO-18-147635	R-37 S1	REG	SW-846:6010C	0	17
CAMO-18-147635	R-37 S1	REG	SW-846:6020	0	11
CAMO-18-147635	R-37 S1	REG	SW-846:6850	0	1
CAMO-18-147650	R-37 S1	REG	EPA:170.0	0	1
CAMO-18-147650	R-37 S1	REG	EPA:245.2	0	1
CAMO-18-147650	R-37 S1	REG	EPA:335.4	0	1
CAMO-18-147650	R-37 S1	REG	EPA:351.2	0	1
CAMO-18-147650	R-37 S1	REG	EPA:900	0	2
CAMO-18-147650	R-37 S1	REG	EPA:901.1	0	5
CAMO-18-147650	R-37 S1	REG	EPA:905.0	0	1
CAMO-18-147650	R-37 S1	REG	HASL-300:AM-241	0	1
CAMO-18-147650	R-37 S1	REG	HASL-300:ISOPU	0	2
CAMO-18-147650	R-37 S1	REG	HASL-300:ISOU	0	3
CAMO-18-147650	R-37 S1	REG	SW-846:8260B	0	80
CAMO-18-147650	R-37 S1	REG	SW-846:8270D	0	80
CAMO-18-147650	R-37 S1	REG	SW-846:9060	0	1
CAMO-18-147672	R-37 S1	FTB	EPA:170.0	0	1
CAMO-18-147672	R-37 S1	FTB	SW-846:8260B	0	80
CAMO-18-147678	R-37 S1	FB	EPA:170.0	0	1
CAMO-18-147678	R-37 S1	FB	SW-846:8260B	0	80
CAMO-18-147678	R-37 S1	FB	SW-846:8270D	0	80
CAMO-18-147680	R-37 S1	FD	EPA:120.1	0	1
CAMO-18-147680	R-37 S1	FD	EPA:150.1	0	1
CAMO-18-147680	R-37 S1	FD	EPA:160.1	0	1
CAMO-18-147680	R-37 S1	FD	EPA:170.0	0	1
CAMO-18-147680	R-37 S1	FD	EPA:245.2	0	1
CAMO-18-147680	R-37 S1	FD	EPA:300.0	0	4
CAMO-18-147680	R-37 S1	FD	EPA:310.1	0	2

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-18-147680	R-37 S1	FD	EPA:350.1	0	1
CAMO-18-147680	R-37 S1	FD	EPA:353.2	0	1
CAMO-18-147680	R-37 S1	FD	EPA:365.4	0	1
CAMO-18-147680	R-37 S1	FD	SM:A2340B	0	1
CAMO-18-147680	R-37 S1	FD	SW-846:6010C	0	17
CAMO-18-147680	R-37 S1	FD	SW-846:6020	0	11
CAMO-18-147680	R-37 S1	FD	SW-846:6850	0	1
CAMO-18-147683	R-37 S1	FD	EPA:170.0	0	1
CAMO-18-147683	R-37 S1	FD	EPA:245.2	0	1
CAMO-18-147683	R-37 S1	FD	EPA:335.4	0	1
CAMO-18-147683	R-37 S1	FD	EPA:351.2	0	1
CAMO-18-147683	R-37 S1	FD	EPA:900	0	2
CAMO-18-147683	R-37 S1	FD	EPA:901.1	0	5
CAMO-18-147683	R-37 S1	FD	EPA:905.0	0	1
CAMO-18-147683	R-37 S1	FD	HASL-300:AM-241	0	1
CAMO-18-147683	R-37 S1	FD	HASL-300:ISOPU	0	2
CAMO-18-147683	R-37 S1	FD	HASL-300:ISOU	0	3
CAMO-18-147683	R-37 S1	FD	SW-846:8260B	0	80
CAMO-18-147683	R-37 S1	FD	SW-846:8270D	0	80
CAMO-18-147683	R-37 S1	FD	SW-846:9060	0	1
CAPA-18-147550	R-23	REG	EPA:120.1	0	1
CAPA-18-147550	R-23	REG	EPA:150.1	0	1
CAPA-18-147550	R-23	REG	EPA:160.1	0	1
CAPA-18-147550	R-23	REG	EPA:170.0	0	1
CAPA-18-147550	R-23	REG	EPA:245.2	0	1
CAPA-18-147550	R-23	REG	EPA:300.0	0	4
CAPA-18-147550	R-23	REG	EPA:310.1	0	2
CAPA-18-147550	R-23	REG	EPA:350.1	0	1
CAPA-18-147550	R-23	REG	EPA:353.2	0	1
CAPA-18-147550	R-23	REG	EPA:365.4	0	1
CAPA-18-147550	R-23	REG	SM:A2340B	0	1
CAPA-18-147550	R-23	REG	SW-846:6010C	0	17
CAPA-18-147550	R-23	REG	SW-846:6020	0	11
CAPA-18-147550	R-23	REG	SW-846:6850	0	1
CAPA-18-147555	R-39	REG	EPA:120.1	0	1
CAPA-18-147555	R-39	REG	EPA:150.1	0	1
CAPA-18-147555	R-39	REG	EPA:160.1	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147555	R-39	REG	EPA:170.0	0	1
CAPA-18-147555	R-39	REG	EPA:245.2	0	1
CAPA-18-147555	R-39	REG	EPA:300.0	0	4
CAPA-18-147555	R-39	REG	EPA:310.1	0	2
CAPA-18-147555	R-39	REG	EPA:350.1	0	1
CAPA-18-147555	R-39	REG	EPA:353.2	0	1
CAPA-18-147555	R-39	REG	EPA:365.4	0	1
CAPA-18-147555	R-39	REG	SM:A2340B	0	1
CAPA-18-147555	R-39	REG	SW-846:6010C	0	17
CAPA-18-147555	R-39	REG	SW-846:6020	0	11
CAPA-18-147555	R-39	REG	SW-846:6850	0	1
CAPA-18-147576	R-23	REG	EPA:170.0	0	1
CAPA-18-147576	R-23	REG	EPA:245.2	0	1
CAPA-18-147576	R-23	REG	EPA:335.4	0	1
CAPA-18-147576	R-23	REG	EPA:351.2	0	1
CAPA-18-147576	R-23	REG	EPA:900	0	2
CAPA-18-147576	R-23	REG	EPA:901.1	0	5
CAPA-18-147576	R-23	REG	EPA:905.0	0	1
CAPA-18-147576	R-23	REG	HASL-300:AM-241	0	1
CAPA-18-147576	R-23	REG	HASL-300:ISOPU	0	2
CAPA-18-147576	R-23	REG	HASL-300:ISOU	0	3
CAPA-18-147576	R-23	REG	SW-846:8260B	0	80
CAPA-18-147576	R-23	REG	SW-846:8270D	0	80
CAPA-18-147576	R-23	REG	SW-846:9060	0	1
CAPA-18-147581	R-39	REG	EPA:170.0	0	1
CAPA-18-147581	R-39	REG	EPA:245.2	0	1
CAPA-18-147581	R-39	REG	EPA:335.4	0	1
CAPA-18-147581	R-39	REG	EPA:351.2	0	1
CAPA-18-147581	R-39	REG	EPA:900	0	2
CAPA-18-147581	R-39	REG	EPA:901.1	0	5
CAPA-18-147581	R-39	REG	EPA:905.0	0	1
CAPA-18-147581	R-39	REG	HASL-300:AM-241	0	1
CAPA-18-147581	R-39	REG	HASL-300:ISOPU	0	2
CAPA-18-147581	R-39	REG	HASL-300:ISOU	0	3
CAPA-18-147581	R-39	REG	SW-846:8260B	0	80
CAPA-18-147581	R-39	REG	SW-846:8270D	0	80
CAPA-18-147581	R-39	REG	SW-846:9060	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-18-147606	R-23	FTB	EPA:170.0	0	1
CAPA-18-147606	R-23	FTB	SW-846:8260B	0	80
CAPA-18-147608	R-39	FTB	EPA:170.0	0	1
CAPA-18-147608	R-39	FTB	SW-846:8260B	0	80

November 17, 2017

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

Re: LANL- WQH Water Samples
Work Order: 436463
SDG: 2018-584

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 27, 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: 2018-584
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 436463
SDG: 2018-584

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 436463
SDG # : 2018-584**

November 22, 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 October 27, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperatures were checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
436463001	CAPA-18-147550
436463002	CAPA-18-147576
436463003	CAPA-18-147576
436463004	CAPA-18-147606
436463005	CAMO-18-147635
436463006	CAMO-18-147650
436463007	CAMO-18-147650
436463008	CAMO-18-147672
436463009	CAMO-18-147678
436463010	CAMO-18-147680
436463011	CAMO-18-147683
436463012	CAMO-18-147683
436463013	CAPA-18-147555
436463014	CAPA-18-147581
436463015	CAPA-18-147581
436463016	CAPA-18-147608

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.



Valerie Davis
Project Manager

List of current GEL Certifications as of 17 November 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	SC000122017-24
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

TEST - Explosives			
Samples collected from a WFO area?			
NO	YES		
Field Test for Explosives Results			
NO	YES		
Spot test shows presence of explosives residues. If YES - Do not ship.			

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

TEST - Field Screen			
The sample has field screening measurements of alpha activity and beta activity?			
NO	YES		
Sample Activity (dpm/100cm ²)			
Alpha detectable			
Alpha > 160,000			
MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			
Alpha > 1,250,000			
Beta > 15,000,000			
Beta > 15,000,000			
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			
Prior analytical measurements of radioactive isotopes are available?			
NO	YES		
Sample Activity (pCi/g)			
Am-241 > 27			
Cs-137 > 270			
Pu-238 > 27			
Pu-239/240 > 27			
Th-228 > 27			
U-234 > 270			
U-238 > 270			
H-3 > 27,000,000			
Am-241 > 270,000			
Cs-137 > 270,000			
Pu-238 > 270,000			
Pu-239/240 > 270,000			
Th-228 > 270,000			
U-234 > 1,600,000,000			
U-238 > unlimited			
H-3 > 27,000,000,000			
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.			
Shipment Activity (pCi)			
NO	YES		
Sample Activity (pCi/g)			
Am-241 > 27			
Cs-137 > 270			
Pu-238 > 27			
Pu-239/240 > 27			
Th-228 > 27			
U-234 > 270			
U-238 > 270			
H-3 > 27,000,000			
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, and the sample is submitted to ARS or RP for hazard classification analysis.			
The shippers documented knowledge of the sample positively identifies appropriate labeling.			
TEST - AK			
NO	YES		
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.			

HOLD SAMPLES FOR ANALYSIS			
The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7]			

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:	(Printed Name) MATT EVGERT
Date/Time	10-26-17 15:00
(Signature)	

Hazard Assessment Reviewed By:	(Printed Name) Miss. M. J.
Date/Time	10/26/17 3:00
(Signature)	



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESH</u>		SDG/AR/COC/Work Order: <u>4310463</u>	
Received By: <u>ZKW</u>		Date Received: <u>10/27/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1783 0596-15°C (rchem)</u> <u>5908 1783 0622-1°C</u> <u>5908 1783 0600-1°C</u> <u>5908 1783 0611-1°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> <u>CPM</u> / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice <u>Ice Packs</u> Dry ice <u>None</u> Other: _____ *all temperatures are recorded in Celsius TEMP: <u>See Above</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes _____ No <input checked="" type="checkbox"/> N/A _____ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A _____ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>See Below</u>
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):

* We rec'd WST15-17-148252 for VOA collected 10/18/17 @ 11:30
 * We rec'd CAPM-18-148326 for TAL Metals, AM241 + GS + PU + SR90 collected 10/25/17 @ 10:50
 * We only rec'd 2 containers for -147262 and -147263

PM (or PMA) review: Initials JBSDate 10.30.2017Page 1 of 1

GL-CHL-SR-001 Rev 5

(505) 665-9966

SHIP DATE: 26OCT17
ACTWGT: 59.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

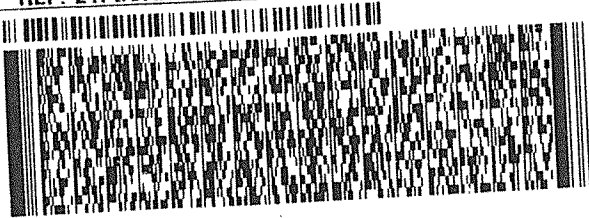
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 656-8171

REF: 21PDOARSGW04BAGWSO



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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: 26OCT17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

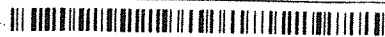
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 656-8171

REF: 21PDOARSGW04BAGWSO



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TRK# 5908 1783 0622
0201

FRI - 27 OCT 10:30A
PRIORITY OVERNIGHT

X7 RBWA

29407

SC-US

CHS



3 of 3

MPS# 5908 1783 0611
0263

Mstr# 5908 1783 0596

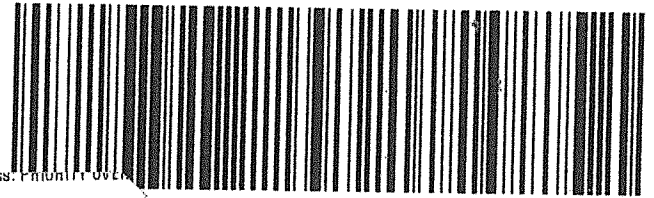
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FRI - 27 OCT 10:
PRIORITY OVERNIGHT

X7 RBWA

294

SC-US C



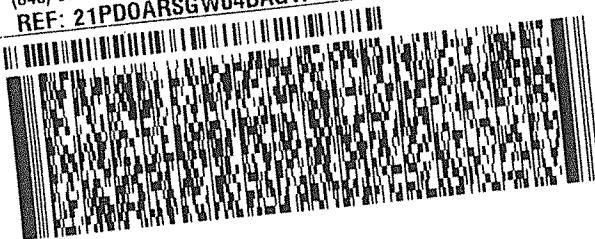
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
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ORIGIN ID: SAFA
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237
LOS ALAMOS, NM
UNITED STATES US

SHIP DATE: 26OCT17
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2916

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TO VALERIE DAVIS
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REF: 21PDOARSGW04BAGWSO



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PRIORITY OVERNIGHT

1 of 3
TRK# 5908 1783 0596
0201

MASTER

V7 RRWA

29407

SC-US

CHS

MPS# 5908 1783 0600
0263

Mstr# 5908 1783 0596

0201

FRI - 27 OCT 10:
PRIORITY OVERNIGHT

X7 RBWA

29

SC-US

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 #: 2018-584
Work Order #: 436463**

Method/Analysis Information

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

Analytical Method: SW-846:8260B

Analytical Batch
Number: 1716887

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
436463003	CAPA-18-147576
436463004	CAPA-18-147606
436463007	CAMO-18-147650
436463008	CAMO-18-147672
436463009	CAMO-18-147678
436463012	CAMO-18-147683
436463015	CAPA-18-147581
436463016	CAPA-18-147608
1203914644	Method Blank (MB)
1203914645	Laboratory Control Sample (LCS)
1203914646	436463003(CAPA-18-147576) Post Spike (PS)
1203914647	436463003(CAPA-18-147576) Post Spike Duplicate (PSD)
1203914648	Laboratory Control Sample (LCS)
1203914649	436463003(CAPA-18-147576) Post Spike (PS)
1203914650	436463003(CAPA-18-147576) Post Spike Duplicate (PSD)

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

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

SOP Reference

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

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package. The surrogate compounds

were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

Quality Control (QC) Information

Blank (MB) Statement

The blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 436463003 (CAPA-18-147576) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement

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

Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Sample Preservation and Integrity

All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

TIC Comment

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

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

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

Electronic Package Comment

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOAA.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890A/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-584 GEL Work Order: 436463

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 18 NOV 2017

Title: Data Validator

Sample Data Summary

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 436463003
Client Sample: VOA,SVOA
Client ID: CAPA-18-147576
Batch ID: 1716887
Run Date: 11/07/2017 22:29
Prep Date: 11/07/2017 22:29
Data File: 110717\AH235.D

Date Collected: 10/25/2017 09:44
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463003
Client Sample: VOA,SVOA
Client ID: CAPA-18-147576
Batch ID: 1716887
Run Date: 11/07/2017 22:29
Prep Date: 11/07/2017 22:29
Data File: 110717\AH235.D

Date Collected: 10/25/2017 09:44
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 436463003	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAPA-18-147576	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/07/2017 22:29	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/07/2017 22:29		
Data File: 110717\AH235.D	Column: DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.1	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	51.3	50.0	ug/L 103	(70%-131%)
Toluene-d8	50.3	50.0	ug/L 101	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	7.6	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 436463004
Client Sample: VOA
Client ID: CAPA-18-147606
Batch ID: 1716887
Run Date: 11/07/2017 22:52
Prep Date: 11/07/2017 22:52
Data File: 110717\AH236.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463004
Client Sample: VOA
Client ID: CAPA-18-147606
Batch ID: 1716887
Run Date: 11/07/2017 22:52
Prep Date: 11/07/2017 22:52
Data File: 110717\AH236.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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:	2018-584	Date Collected:	10/25/2017 13:50	Matrix:	W
Lab Sample ID:	436463004	Date Received:	10/27/2017 08:55		
Client Sample:	VOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAPA-18-147606	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/07/2017 22:52	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/07/2017 22:52				
Data File:	110717\AH236.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	53.8	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.7	50.0	ug/L 101	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	8.79	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 436463007
Client Sample: VOA,SVOA
Client ID: CAMO-18-147650
Batch ID: 1716887
Run Date: 11/07/2017 23:16
Prep Date: 11/07/2017 23:16
Data File: 110717\AH237.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463007
Client Sample: VOA,SVOA
Client ID: CAMO-18-147650
Batch ID: 1716887
Run Date: 11/07/2017 23:16
Prep Date: 11/07/2017 23:16
Data File: 110717\AH237.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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:	2018-584	Date Collected:	10/25/2017 13:50	Matrix:	W
Lab Sample ID:	436463007	Date Received:	10/27/2017 08:55		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAMO-18-147650	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/07/2017 23:16	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/07/2017 23:16				
Data File:	110717\AH237.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	53.8	50.0	ug/L 108	(71%-134%)
Bromofluorobenzene	52.4	50.0	ug/L 105	(70%-131%)
Toluene-d8	51.3	50.0	ug/L 103	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000115-10-6	Dimethyl ether	3.433	7.56	ug/L	5	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 436463008
Client Sample: VOA
Client ID: CAMO-18-147672
Batch ID: 1716887
Run Date: 11/07/2017 23:40
Prep Date: 11/07/2017 23:40
Data File: 110717\AH238.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463008
Client Sample: VOA
Client ID: CAMO-18-147672
Batch ID: 1716887
Run Date: 11/07/2017 23:40
Prep Date: 11/07/2017 23:40
Data File: 110717\AH238.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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**

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SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463008	Date Received: 10/27/2017 08:55	
Client Sample: VOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147672	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/07/2017 23:40	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/07/2017 23:40		
Data File: 110717\AH238.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	53.3	50.0	ug/L 107	(71%-134%)
Bromofluorobenzene	53.3	50.0	ug/L 107	(70%-131%)
Toluene-d8	51.3	50.0	ug/L 103	(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: 2018-584
Lab Sample ID: 436463009
Client Sample: VOA,SVOA
Client ID: CAMO-18-147678
Batch ID: 1716887
Run Date: 11/08/2017 00:04
Prep Date: 11/08/2017 00:04
Data File: 110717\AH239.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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

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SDG Number: 2018-584
Lab Sample ID: 436463009
Client Sample: VOA,SVOA
Client ID: CAMO-18-147678
Batch ID: 1716887
Run Date: 11/08/2017 00:04
Prep Date: 11/08/2017 00:04
Data File: 110717\AH239.D

Date Collected: 10/25/2017 13:50
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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**

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SDG Number:	2018-584	Date Collected:	10/25/2017 13:50	Matrix:	W
Lab Sample ID:	436463009	Date Received:	10/27/2017 08:55		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAMO-18-147678	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/08/2017 00:04	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/08/2017 00:04				
Data File:	110717\AH239.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	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	52.7	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.4	50.0	ug/L 101	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	8.87	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-584
Lab Sample ID: 436463012
Client Sample: VOA,SVOA
Client ID: CAMO-18-147683
Batch ID: 1716887
Run Date: 11/08/2017 00:27
Prep Date: 11/08/2017 00:27
Data File: 110717\AH240.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463012	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147683	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 00:27	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 00:27		
Data File: 110717\AH240.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: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463012	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147683	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 00:27	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 00:27		
Data File: 110717\AH240.D	Column: DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.8	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	53.1	50.0	ug/L 106	(70%-131%)
Toluene-d8	51.6	50.0	ug/L 103	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	8.82	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-584
Lab Sample ID: 436463015
Client Sample: VOA,SVOA
Client ID: CAPA-18-147581
Batch ID: 1716887
Run Date: 11/08/2017 00:51
Prep Date: 11/08/2017 00:51
Data File: 110717\AH241.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463015
Client Sample: VOA,SVOA
Client ID: CAPA-18-147581
Batch ID: 1716887
Run Date: 11/08/2017 00:51
Prep Date: 11/08/2017 00:51
Data File: 110717\AH241.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463015	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAPA-18-147581	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 00:51	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 00:51		
Data File: 110717\AH241.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	51.3	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	52.5	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.2	50.0	ug/L 100	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.423	7.5	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 436463016
Client Sample: VOA
Client ID: CAPA-18-147608
Batch ID: 1716887
Run Date: 11/08/2017 01:14
Prep Date: 11/08/2017 01:14
Data File: 110717\AH242.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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
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: 2018-584
Lab Sample ID: 436463016
Client Sample: VOA
Client ID: CAPA-18-147608
Batch ID: 1716887
Run Date: 11/08/2017 01:14
Prep Date: 11/08/2017 01:14
Data File: 110717\AH242.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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:	2018-584	Date Collected:	10/25/2017 11:51	Matrix:	W
Lab Sample ID:	436463016	Date Received:	10/27/2017 08:55		
Client Sample:	VOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAPA-18-147608	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/08/2017 01:14	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/08/2017 01:14				
Data File:	110717\AH242.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	53.2	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	54.8	50.0	ug/L 110	(70%-131%)
Toluene-d8	51.5	50.0	ug/L 103	(74%-124%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	3.413	8.04	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2018-584**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203914645	LCS for batch 1716887	101	98	100
1203914648	LCS for batch 1716887	103	100	105
1203914644	MB for batch 1716887	100	100	101
436463003	CAPA-18-147576	104	101	103
436463004	CAPA-18-147606	108	101	105
436463007	CAMO-18-147650	108	103	105
436463008	CAMO-18-147672	107	103	107
436463009	CAMO-18-147678	106	101	105
436463012	CAMO-18-147683	106	103	106
436463015	CAPA-18-147581	103	100	105
436463016	CAPA-18-147608	106	103	110
1203914646	CAPA-18-147576PS	102	100	100
1203914647	CAPA-18-147576PSD	103	101	102
1203914649	CAPA-18-147576PS	104	101	108
1203914650	CAPA-18-147576PSD	104	100	107

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: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1716887

Matrix: WATER

Lab Sample ID 1203914645

Instrument: VOAA.I

Analysis Date: 11/07/2017 20:54

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	97.6	98	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1170	93	61-125
67-64-1	LCS Acetone	250	0.0	275	110	48-157
74-88-4	LCS Iodomethane	250	0.0	240	96	72-128
75-15-0	LCS Carbon disulfide	250	0.0	244	97	69-138
108-05-4	LCS Vinyl acetate	250	0.0	272	109	67-125
78-93-3	LCS 2-Butanone	250	0.0	287	115	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	260	104	66-124
591-78-6	LCS 2-Hexanone	250	0.0	310	124	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	60.9	122	40-160
74-87-3	LCS Chloromethane	50.0	0.0	50.4	101	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	51.4	103	65-137
74-83-9	LCS Bromomethane	50.0	0.0	38.4	77	63-137
75-00-3	LCS Chloroethane	50.0	0.0	49.3	99	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	54.5	109	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.7	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	50.2	100	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	47.7	95	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	49.8	100	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	49.8	100	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	48.3	97	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	48.1	96	75-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1716887

Matrix: WATER

Lab Sample ID 1203914645

Instrument: VOAA.I

Analysis Date: 11/07/2017 20:54

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	52.8	106	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	49.4	99	76-125
67-66-3	LCS Chloroform	50.0	0.0	47.8	96	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	46.9	94	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	54.4	109	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	49.9	100	74-122
71-43-2	LCS Benzene	50.0	0.0	45.6	91	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	48.6	97	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	46.9	94	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	52.8	106	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	51.6	103	78-131
108-88-3	LCS Toluene	50.0	0.0	47.2	94	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	55.5	111	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	48.1	96	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	47.1	94	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	46.6	93	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	50.0	100	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	51.9	104	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	47.8	96	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	48.2	96	73-125

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1716887

Matrix: WATER

Lab Sample ID 1203914645

Instrument: VOAA.I

Analysis Date: 11/07/2017 20:54

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	48.9	98	74-126
100-42-5	LCS Styrene	50.0	0.0	53.6	107	72-130
75-25-2	LCS Bromoform	50.0	0.0	62.2	124	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	49.5	99	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	49.2	98	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	50.6	101	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	48.4	97	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	47.9	96	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	50.3	101	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	48.6	97	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	50.3	101	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	50.4	101	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	49.6	99	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	51.1	102	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	47.1	94	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	46.9	94	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	49.0	98	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	60.8	122	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	48.4	97	72-136
91-20-3	LCS Naphthalene	50.0	0.0	54.2	108	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	50.5	101	70-130

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 4

SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1716887

Matrix: WATER

Lab Sample ID 1203914645

Instrument: VOAA.I

Analysis Date: 11/07/2017 20:54

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	50.8	102	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	54.3	109	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	47.8	96	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	5060	101	63-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-584

Sample Type: Post Spike

Client ID: CAPA-18-147576PS

Matrix: W

Lab Sample ID 1203914646

Instrument: VOAA.I

Analysis Date: 11/08/2017 01:38

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	98.5	99	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1190	95	56-131
67-64-1	PS Acetone	250	0.00 U	118	47	25-155
74-88-4	PS Iodomethane	250	0.00 U	250	100	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	258	103	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	254	102	48-133
78-93-3	PS 2-Butanone	250	0.00 U	165	66	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	255	102	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	217	87	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	56.3	113	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	57.7	115	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	58.9	118	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	44.6	89	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	48.4	97	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	53.1	106	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	50.3	101	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	49.5	99	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	49.9	100	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	51.7	103	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	50.7	101	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	51.3	103	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	50.5	101	69-127

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2018-584

Sample Type: Post Spike

Client ID: CAPA-18-147576PS

Matrix: W

Lab Sample ID 1203914646

Instrument: VOAA.I

Analysis Date: 11/08/2017 01:38

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	51.3	103	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	50.2	100	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	50.9	102	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	47.4	95	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	55.0	110	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	54.1	108	69-130
71-43-2	PS Benzene	50.0	0.00 U	46.9	94	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	49.6	99	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	48.8	98	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	52.2	104	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	54.9	110	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	50.7	101	70-134
108-88-3	PS Toluene	50.0	0.00 U	48.2	96	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	55.6	111	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	50.4	101	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	51.6	103	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	45.4	91	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	51.1	102	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	54.1	108	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	48.5	97	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	48.9	98	61-130

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Client ID: CAPA-18-147576PS

Lab Sample ID 1203914646

Instrument: VOAA.I

Analyst: JEB

Purge Vol: 5 mL

Sample Type: Post Spike

Matrix: W

Analysis Date: 11/08/2017 01:38

Dilution: 1

Batch ID: 1716887

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	50.0	100	62-131
100-42-5	PS Styrene	50.0	0.00 U	54.8	110	59-135
75-25-2	PS Bromoform	50.0	0.00 U	60.4	121	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	49.0	98	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	51.3	103	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	52.9	106	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	48.1	96	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	48.0	96	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	51.2	102	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	49.2	98	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	47.4	95	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	49.5	99	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	50.6	101	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	50.3	101	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	50.9	102	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	47.0	94	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	46.8	94	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	49.3	99	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	62.3	125	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	45.3	91	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	56.9	114	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	50.2	100	52-135

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-584

Sample Type: Post Spike

Client ID: CAPA-18-147576PS

Matrix: W

Lab Sample ID 1203914646

Instrument: VOAA.I

Analysis Date: 11/08/2017 01:38

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	48.7	97	50-133
630-20-6	PS	1,1,1,2-Tetrachloroethane	50.0	0.00	U	57.0	114	71-133
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	U	48.5	97	60-125
71-36-3	PS	n-Butyl alcohol	5000	0.00	U	4870	97	60-140

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147576PSD

Matrix: W

Lab Sample ID 1203914647

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:02

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	97.5	98	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1180	95	56-131	1	0-20
67-64-1	PSD Acetone	250	0.00 U	116	46	25-155	2	0-20
74-88-4	PSD Iodomethane	250	0.00 U	250	100	66-133	0	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	256	102	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	255	102	48-133	1	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	159	64	25-143	4	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	247	99	61-127	3	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	206	82	33-138	5	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	59.2	118	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	57.3	115	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	57.8	116	58-140	2	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	42.6	85	59-146	5	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	49.8	100	65-129	3	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	54.2	108	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.9	104	69-127	3	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	50.0	100	59-130	1	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	49.9	100	62-123	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	51.1	102	69-132	1	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	51.1	102	65-127	1	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	50.7	101	67-127	1	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	49.6	99	69-127	2	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147576PSD

Matrix: W

Lab Sample ID 1203914647

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:02

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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 51.1	102	66-137	0	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	U 49.9	100	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00	U 49.6	99	71-129	1	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 46.8	94	67-130	1	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	U 54.3	109	66-143	1	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	U 52.8	106	69-130	3	0-20
71-43-2	PSD Benzene	50.0	0.00	U 46.1	92	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	U 48.3	97	65-131	3	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	U 47.9	96	67-127	2	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	U 50.8	102	72-129	3	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	U 53.7	107	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	U 49.8	100	70-134	2	0-20
108-88-3	PSD Toluene	50.0	0.00	U 47.5	95	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	U 54.7	109	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	U 48.9	98	66-125	3	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	U 50.1	100	67-124	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	U 45.1	90	60-130	1	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	U 50.1	100	68-143	2	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00	U 52.9	106	71-127	2	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	U 47.8	96	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	U 48.4	97	61-130	1	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147576PSD

Matrix: W

Lab Sample ID 1203914647

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:02

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	49.7	99	62-131	1	0-20
100-42-5	PSD Styrene	50.0	0.00 U	54.0	108	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	59.9	120	64-138	1	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	49.0	98	55-133	0	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	49.8	100	62-129	3	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	51.3	103	70-124	3	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	48.1	96	62-124	0	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	47.8	96	50-133	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	50.7	101	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	48.8	98	56-128	1	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	47.5	95	53-130	0	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	49.5	99	55-135	0	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	50.2	100	53-132	1	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	49.7	99	50-138	1	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	50.6	101	49-138	1	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	46.9	94	56-126	0	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	46.5	93	55-125	0	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	48.9	98	43-142	1	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	59.8	120	62-141	4	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	46.3	93	40-147	2	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	56.2	112	62-134	1	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	50.5	101	52-135	0	0-20

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-584

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147576PSD

Matrix: W

Lab Sample ID 1203914647

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:02

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	49.2	98	50-133	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	55.6	111	71-133	2	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	48.2	96	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4850	97	60-140	1	0-20

Volatile

Page 1 of 1

Quality Control Summary
Spike Recovery Report

SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1716887

Matrix: WATER

Lab Sample ID 1203914648

Instrument: VOAA.I

Analysis Date: 11/07/2017 21:41

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	237	95	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	247	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	243	97	59-125
107-13-1	LCS Acrylonitrile	250	0.0	235	94	65-122
107-12-0	LCS Propionitrile	250	0.0	230	92	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	250	100	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	259	104	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	250	100	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2380	95	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	49.1	98	66-147

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2018-584

Sample Type: Post Spike

Client ID: CAPA-18-147576PS

Matrix: W

Lab Sample ID 1203914649

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:25

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits
107-02-8	PS	Acrolein	250	0.00	U	227	91	49-141
76-13-1	PS	Trichlorotrifluoroethane	250	0.00	U	244	97	57-149
107-05-1	PS	Allyl chloride	250	0.00	U	241	97	54-128
107-13-1	PS	Acrylonitrile	250	0.00	U	235	94	59-129
107-12-0	PS	Propionitrile	250	0.00	U	230	92	58-131
126-98-7	PS	Methacrylonitrile	250	0.00	U	253	101	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	249	100	60-136
78-83-1	PS	Isobutyl alcohol	2500	0.00	U	2390	96	60-143
126-99-8	PS	2-Chloro-1,3-butadiene	50.0	0.00	U	47.6	95	63-146

Volatile

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Quality Control Summary
Spike Recovery Report

SDG Number: 2018-584

Sample Type: Post Spike Duplicate

Client ID: CAPA-18-147576PSD

Matrix: W

Lab Sample ID 1203914650

Instrument: VOAA.I

Analysis Date: 11/08/2017 02:49

Dilution: 1

Analyst: JEB

Purge Vol: 5 mL

Batch ID: 1716887

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	228	91	49-141	0	0-20
76-13-1	PSD	Trichlorotrifluoroethane	250	0.00	U	242	97	57-149	1	0-20
107-05-1	PSD	Allyl chloride	250	0.00	U	244	98	54-128	1	0-20
107-13-1	PSD	Acrylonitrile	250	0.00	U	232	93	59-129	1	0-20
107-12-0	PSD	Propionitrile	250	0.00	U	225	90	58-131	2	0-20
126-98-7	PSD	Methacrylonitrile	250	0.00	U	250	100	59-134	1	0-20
80-62-6	PSD	Methyl methacrylate	250	0.00	U	257	103	62-135	0	0-20
97-63-2	PSD	Ethyl methacrylate	250	0.00	U	250	100	60-136	0	0-20
78-83-1	PSD	Isobutyl alcohol	2500	0.00	U	2310	92	60-143	3	0-20
126-99-8	PSD	2-Chloro-1,3-butadiene	50.0	0.00	U	47.2	94	63-146	1	0-20

Method Blank Summary

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SDG Number:	2018-584	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1716887	Instrument ID:	VOAA.I	Data File:	110717\AH234AR.D
Lab Sample ID:	1203914644	Prep Date:	11/07/2017 22:05	Analyzed:	11/07/17 22:05
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 1716887	1203914645	110717\AH231AR.D	11/07/17	2054
02 LCS for batch 1716887	1203914648	110717\AH233AR.D	11/07/17	2141
03 CAPA-18-147576	436463003	110717\AH235.D	11/07/17	2229
04 CAPA-18-147606	436463004	110717\AH236.D	11/07/17	2252
05 CAMO-18-147650	436463007	110717\AH237.D	11/07/17	2316
06 CAMO-18-147672	436463008	110717\AH238.D	11/07/17	2340
07 CAMO-18-147678	436463009	110717\AH239.D	11/08/17	0004
08 CAMO-18-147683	436463012	110717\AH240.D	11/08/17	0027
09 CAPA-18-147581	436463015	110717\AH241.D	11/08/17	0051
10 CAPA-18-147608	436463016	110717\AH242.D	11/08/17	0114
11 CAPA-18-147576PS	1203914646	110717\AH243.D	11/08/17	0138
12 CAPA-18-147576PSD	1203914647	110717\AH244.D	11/08/17	0202
13 CAPA-18-147576PS	1203914649	110717\AH245.D	11/08/17	0225
14 CAPA-18-147576PSD	1203914650	110717\AH246.D	11/08/17	0249

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-584

Lab Sample ID: 1203914644

Client Sample: QC for batch 1716887

Client ID: MB for batch 1716887

Batch ID: 1716887

Run Date: 11/07/2017 22:05

Prep Date: 11/07/2017 22:05

Data File: 110717\AH234AR.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.I

Analyst: JEB

Column: DB-624

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-038

Dilution: 1

Purge Vol: 5 mL

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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-584
Lab Sample ID: 1203914644
Client Sample: QC for batch 1716887
Client ID: MB for batch 1716887
Batch ID: 1716887
Run Date: 11/07/2017 22:05
Prep Date: 11/07/2017 22:05
Data File: 110717\AH234AR.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

Column: DB-624

Matrix: WATER

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

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

Volatile
Certificate of Analysis
Sample Summary

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SDG Number:	2018-584	Matrix:	WATER
Lab Sample ID:	1203914644		
Client Sample:	QC for batch 1716887	Client:	ARSL004
Client ID:	MB for batch 1716887	Method:	SW-846:8260B
Batch ID:	1716887	Inst:	VOAA.I
Run Date:	11/07/2017 22:05	Analyst:	JEB
Prep Date:	11/07/2017 22:05		
Data File:	110717\AH234AR.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	49.9	50.0	ug/L 100	(71%-134%)
Bromofluorobenzene	50.4	50.0	ug/L 101	(70%-131%)
Toluene-d8	50.2	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		

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584

Lab Sample ID: 1203914645

Client Sample: QC for batch 1716887

Client ID: LCS for batch 1716887

Batch ID: 1716887

Run Date: 11/07/2017 20:54

Prep Date: 11/07/2017 20:54

Data File: 110717\AH231AR.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOAA.I

Analyst: JEB

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		54.3	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		49.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.1	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		48.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		50.2	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		50.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		50.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.4	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		60.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.9	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		47.8	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		49.9	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		46.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		47.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		47.1	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.9	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.8	ug/L	0.300	1.00
78-93-3	2-Butanone		287	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		48.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		310	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.8	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		51.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		260	ug/L	1.50	5.00
67-64-1	Acetone		275	ug/L	1.50	10.0
75-05-8	Acetonitrile		1170	ug/L	8.00	25.0
107-02-8	Acrolein	U	1.50	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	1.50	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	1.50	ug/L	1.50	5.00
71-43-2	Benzene		45.6	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.4	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.8	ug/L	0.300	1.00
75-25-2	Bromoform		62.2	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-584		Matrix: WATER
Lab Sample ID: 1203914645		
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: LCS for batch 1716887	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/07/2017 20:54	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/07/2017 20:54		
Data File: 110717\AH231AR.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		38.4	ug/L	0.300	1.00
75-15-0	Carbon disulfide		244	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		54.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.8	ug/L	0.300	1.00
75-00-3	Chloroethane		49.3	ug/L	0.300	1.00
67-66-3	Chloroform		47.8	ug/L	0.300	1.00
74-87-3	Chloromethane		50.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		50.0	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.7	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		60.9	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.2	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		48.4	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		49.5	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		47.7	ug/L	1.00	10.0
91-20-3	Naphthalene		54.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		53.6	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		46.6	ug/L	0.300	1.00
108-88-3	Toluene		47.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.6	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		54.5	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		272	ug/L	1.50	5.00
75-01-4	Vinyl chloride		51.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		48.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.6	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		97.6	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5060	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		49.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.9	ug/L	0.300	1.00
95-47-6	o-Xylene		48.9	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		49.6	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-584
Lab Sample ID: 1203914645
Client Sample: QC for batch 1716887
Client ID: LCS for batch 1716887
Batch ID: 1716887
Run Date: 11/07/2017 20:54
Prep Date: 11/07/2017 20:54
Data File: 110717\AH231AR.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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		49.8	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		50.3	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		49.8	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		55.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.6	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene	50.1	50.0	ug/L	100	(70%-131%)
Toluene-d8	49.0	50.0	ug/L	98	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914646	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 01:38	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 01:38		
Data File: 110717\AH243.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		57.0	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		51.3	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.4	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		51.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		49.5	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.4	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.2	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		52.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		48.7	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.6	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		62.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		54.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.5	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		54.1	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		48.8	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		51.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		47.0	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		51.6	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		46.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		51.3	ug/L	0.300	1.00
78-93-3	2-Butanone		165	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	0.300	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		49.2	ug/L	0.300	1.00
591-78-6	2-Hexanone		217	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		255	ug/L	1.50	5.00
67-64-1	Acetone		118	ug/L	1.50	10.0
75-05-8	Acetonitrile		1190	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		46.9	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		54.9	ug/L	0.300	1.00
75-25-2	Bromoform		60.4	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914646	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 01:38	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 01:38		
Data File: 110717\AH243.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		44.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		258	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.0	ug/L	0.300	1.00
108-90-7	Chlorobenzene		48.5	ug/L	0.300	1.00
75-00-3	Chloroethane		48.4	ug/L	0.300	1.00
67-66-3	Chloroform		50.2	ug/L	0.300	1.00
74-87-3	Chloromethane		57.7	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		51.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		56.3	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.3	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.9	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		45.3	ug/L	0.300	1.00
74-88-4	Iodomethane		250	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		49.0	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		49.9	ug/L	1.00	10.0
91-20-3	Naphthalene		56.9	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.8	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.4	ug/L	0.300	1.00
108-88-3	Toluene		48.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		49.6	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.1	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		254	ug/L	1.50	5.00
75-01-4	Vinyl chloride		58.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		50.5	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		98.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4870	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		49.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		48.0	ug/L	0.300	1.00
95-47-6	o-Xylene		50.0	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		50.3	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914646	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 01:38	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 01:38		
Data File: 110717\AH243.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.7	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		49.5	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		50.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		55.6	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	49.9	50.0	ug/L	100	(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: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914647	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 02:02	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 02:02		
Data File: 110717\AH244.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		55.6	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		49.8	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		48.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		50.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		50.0	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		46.8	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		50.5	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		51.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		49.2	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		50.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		59.8	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		52.9	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		48.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		52.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		47.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		50.7	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		46.9	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		50.1	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		51.1	ug/L	0.300	1.00
78-93-3	2-Butanone		159	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		48.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		206	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		47.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		50.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		247	ug/L	1.50	5.00
67-64-1	Acetone		116	ug/L	1.50	10.0
75-05-8	Acetonitrile		1180	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		46.1	ug/L	0.300	1.00
108-86-1	Bromobenzene		48.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.7	ug/L	0.300	1.00
75-25-2	Bromoform		59.9	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914647	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 02:02	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 02:02		
Data File: 110717\AH244.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		42.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		256	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		54.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.8	ug/L	0.300	1.00
75-00-3	Chloroethane		49.8	ug/L	0.300	1.00
67-66-3	Chloroform		49.6	ug/L	0.300	1.00
74-87-3	Chloromethane		57.3	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		50.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		50.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		59.2	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.9	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	1.50	ug/L	1.50	5.00
100-41-4	Ethylbenzene		48.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		46.3	ug/L	0.300	1.00
74-88-4	Iodomethane		250	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	15.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		49.0	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		49.9	ug/L	1.00	10.0
91-20-3	Naphthalene		56.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	1.50	ug/L	1.50	5.00
100-42-5	Styrene		54.0	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		45.1	ug/L	0.300	1.00
108-88-3	Toluene		47.5	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		54.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	2.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		255	ug/L	1.50	5.00
75-01-4	Vinyl chloride		57.8	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		49.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		49.8	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		97.5	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4850	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		48.9	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		47.8	ug/L	0.300	1.00
95-47-6	o-Xylene		49.7	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		49.7	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2018-584	Date Collected:	10/25/2017 09:44	Matrix:	W
Lab Sample ID:	1203914647	Date Received:	10/27/2017 08:55		
Client Sample:	QC for batch 1716887	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-147576PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/08/2017 02:02	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/08/2017 02:02				
Data File:	110717\AH244.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		51.1	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		49.5	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		51.1	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.3	50.0	ug/L	103	(71%-134%)
Bromofluorobenzene	51.2	50.0	ug/L	102	(70%-131%)
Toluene-d8	50.5	50.0	ug/L	101	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

Page 1 of 3

SDG Number: 2018-584
Lab Sample ID: 1203914648
Client Sample: QC for batch 1716887
Client ID: LCS for batch 1716887
Batch ID: 1716887
Run Date: 11/07/2017 21:41
Prep Date: 11/07/2017 21:41
Data File: 110717\AH233AR.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

Column: DB-624

Matrix: WATER

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

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		49.1	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		237	ug/L	1.50	5.00
107-13-1	Acrylonitrile		235	ug/L	1.50	5.00
107-05-1	Allyl chloride		243	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: 2018-584
Lab Sample ID: 1203914648
Client Sample: QC for batch 1716887
Client ID: LCS for batch 1716887
Batch ID: 1716887
Run Date: 11/07/2017 21:41
Prep Date: 11/07/2017 21:41
Data File: 110717\AH233AR.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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		250	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		2380	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		250	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		259	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	1.00	ug/L	1.00	10.0
91-20-3	Naphthalene	U	0.300	ug/L	0.300	1.00
107-12-0	Propionitrile		230	ug/L	1.50	5.00
100-42-5	Styrene	U	0.300	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	1.00
108-88-3	Toluene	U	0.300	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	0.300	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		247	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	1.50	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	0.300	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	0.300	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	0.300	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	15.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	0.300	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	0.300	ug/L	0.300	1.00
95-47-6	o-Xylene	U	0.300	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	0.300	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2018-584
Lab Sample ID: 1203914648
Client Sample: QC for batch 1716887
Client ID: LCS for batch 1716887
Batch ID: 1716887
Run Date: 11/07/2017 21:41
Prep Date: 11/07/2017 21:41
Data File: 110717\AH233AR.D

Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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	51.5	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	49.8	50.0	ug/L 100	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914649	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 02:25	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 02:25		
Data File: 110717\AH245.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		47.6	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		227	ug/L	1.50	5.00
107-13-1	Acrylonitrile		235	ug/L	1.50	5.00
107-05-1	Allyl chloride		241	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: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914649	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PS	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 02:25	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 02:25		
Data File: 110717\AH245.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		249	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	0.300	ug/L	0.300	1.00
74-88-4	Iodomethane	U	1.50	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2390	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		253	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		230	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		244	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:	2018-584	Date Collected:	10/25/2017 09:44	Matrix:	W
Lab Sample ID:	1203914649	Date Received:	10/27/2017 08:55		
Client Sample:	QC for batch 1716887	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-147576PS	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/08/2017 02:25	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/08/2017 02:25				
Data File:	110717\AH245.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.2	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	54.1	50.0	ug/L 108	(70%-131%)
Toluene-d8	50.4	50.0	ug/L 101	(74%-124%)

Volatile
Certificate of Analysis
Sample Summary

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SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203914650	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1716887	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576PSD	Method: SW-846:8260B	SOP Ref: GL-OA-E-038
Batch ID: 1716887	Inst: VOAA.I	Dilution: 1
Run Date: 11/08/2017 02:49	Analyst: JEB	Purge Vol: 5 mL
Prep Date: 11/08/2017 02:49		
Data File: 110717\AH246.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	0.300	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	0.300	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	0.300	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	0.300	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	0.500	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	0.300	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	0.300	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	0.300	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	0.300	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	0.300	ug/L	0.300	1.00
78-93-3	2-Butanone	U	1.50	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		47.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	0.300	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	1.50	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	0.300	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	0.300	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	1.50	ug/L	1.50	5.00
67-64-1	Acetone	U	1.50	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	8.00	ug/L	8.00	25.0
107-02-8	Acrolein		228	ug/L	1.50	5.00
107-13-1	Acrylonitrile		232	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: 2018-584
Lab Sample ID: 1203914650
Client Sample: QC for batch 1716887
Client ID: CAPA-18-147576PSD
Batch ID: 1716887
Run Date: 11/08/2017 02:49
Prep Date: 11/08/2017 02:49
Data File: 110717\AH246.D

Date Collected: 10/25/2017 09:44
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW-846:8260B
Inst: VOAA.I
Analyst: JEB

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		250	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		2310	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	0.300	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		250	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		257	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		225	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:	2018-584	Date Collected:	10/25/2017 09:44	Matrix:	W
Lab Sample ID:	1203914650	Date Received:	10/27/2017 08:55		
Client Sample:	QC for batch 1716887	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-147576PSD	Method:	SW-846:8260B	SOP Ref:	GL-OA-E-038
Batch ID:	1716887	Inst:	VOAA.I	Dilution:	1
Run Date:	11/08/2017 02:49	Analyst:	JEB	Purge Vol:	5 mL
Prep Date:	11/08/2017 02:49				
Data File:	110717\AH246.D	Column:	DB-624		

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

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.2	50.0	ug/L	104	(71%-134%)
Bromofluorobenzene	53.3	50.0	ug/L	107	(70%-131%)
Toluene-d8	50.1	50.0	ug/L	100	(74%-124%)

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-584
Work Order #: 436463**

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:	1714633
Prep Batch Number:	1714631

Sample Analysis

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

Sample ID	Client ID
436463003	CAPA-18-147576
436463007	CAMO-18-147650
436463009	CAMO-18-147678
436463012	CAMO-18-147683
436463015	CAPA-18-147581
1203909249	Method Blank (MB)
1203909250	Laboratory Control Sample (LCS)
1203909251	436463003(CAPA-18-147576) Matrix Spike (MS)
1203909252	436463003(CAPA-18-147576) 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 436463003 (CAPA-18-147576), 436463007 (CAMO-18-147650), 436463009 (CAMO-18-147678), 436463012 (CAMO-18-147683) and 436463015 (CAPA-18-147581) 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 436463003 (CAPA-18-147576) 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 met the acceptance limits.

Internal Standard (ISTD) Acceptance

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

Technical Information:

Holding Time Specifications

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

Samples 436463007 (CAMO-18-147650), 436463009 (CAMO-18-147678), 436463012 (CAMO-18-147683) and 436463015 (CAPA-18-147581) were re-analyzed due to low acid surrogate recoveries possibly resulting from previously analyzed samples with large amounts of matrix. The re-analysis data were reported.

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 436463003 (CAPA-18-147576), 436463007 (CAMO-18-147650), 436463009 (CAMO-18-147678), 436463012 (CAMO-18-147683) and 436463015 (CAPA-18-147581) 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
MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-584 GEL Work Order: 436463

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- E Concentration of the target analyte exceeds the instrument calibration range
- 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: Cameron Bearden

Date: 22 NOV 2017

Title: Group Leader

Sample Data Summary

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

Page 1 of 3

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 436463003	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAPA-18-147576	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 13:58	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s110217.s\3h0212.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**

SDG Number:	2018-584	Date Collected:	10/25/2017 09:44	Matrix:	W
Lab Sample ID:	436463003	Date Received:	10/27/2017 08:55		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAPA-18-147576	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1714633	Inst:	MSD3.I	Dilution:	1
Run Date:	11/02/2017 13:58	Analyst:	JLD1	Inj. Vol:	1 uL
Prep Date:	11/01/2017 19:20	Aliquot:	1000 mL	Final Volume:	1 mL
Data File:	s110217.s\s3h0212.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: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 436463003	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAPA-18-147576	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 13:58	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 1000 mL	Final Volume: 1 mL
Data File: s110217.s\3h0212.D	Column: DB-5ms	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	68.1	100	ug/L	68 (32%-124%)
2-Fluorobiphenyl	30.8	50.0	ug/L	62 (32%-112%)
2-Fluorophenol	38.9	100	ug/L	39 (15%-88%)
Nitrobenzene-d5	39.0	50.0	ug/L	78 (36%-115%)
Phenol-d5	25.0	100	ug/L	25 (15%-91%)
p-Terphenyl-d14	40.6	50.0	ug/L	81 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.104	81.9	ug/L	95	NJ
000056-23-5	Carbon Tetrachloride	2.339	6.49	ug/L	87	NJ

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

SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463007	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147650	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 16:25	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 990 mL	Final Volume: 1 mL
Data File: s110317a.s\3k0316.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.03	ug/L	3.03	10.1
120-82-1	1,2,4-Trichlorobenzene	U	3.03	ug/L	3.03	10.1
95-50-1	1,2-Dichlorobenzene	U	3.03	ug/L	3.03	10.1
122-66-7	Azobenzene	U	3.03	ug/L	3.03	10.1
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.03	ug/L	3.03	10.1
106-46-7	1,4-Dichlorobenzene	U	3.03	ug/L	3.03	10.1
123-91-1	1,4-Dioxane	J	3.79	ug/L	3.03	10.1
90-12-0	1-Methylnaphthalene	U	0.303	ug/L	0.303	1.01
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.03	ug/L	3.03	10.1
95-95-4	2,4,5-Trichlorophenol	U	3.03	ug/L	3.03	10.1
88-06-2	2,4,6-Trichlorophenol	U	3.03	ug/L	3.03	10.1
120-83-2	2,4-Dichlorophenol	U	3.03	ug/L	3.03	10.1
105-67-9	2,4-Dimethylphenol	U	3.03	ug/L	3.03	10.1
51-28-5	2,4-Dinitrophenol	U	5.05	ug/L	5.05	20.2
121-14-2	2,4-Dinitrotoluene	U	3.03	ug/L	3.03	10.1
606-20-2	2,6-Dinitrotoluene	U	3.03	ug/L	3.03	10.1
91-58-7	2-Chloronaphthalene	U	0.414	ug/L	0.414	1.01
95-57-8	2-Chlorophenol	U	3.03	ug/L	3.03	10.1
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.03	ug/L	3.03	10.1
91-57-6	2-Methylnaphthalene	U	0.303	ug/L	0.303	1.01
88-75-5	2-Nitrophenol	U	3.03	ug/L	3.03	10.1
91-94-1	3,3'-Dichlorobenzidine	U	3.03	ug/L	3.03	10.1
101-55-3	4-Bromophenylphenylether	U	3.03	ug/L	3.03	10.1
59-50-7	Parachlorometa cresol	U	3.03	ug/L	3.03	10.1
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.33	ug/L	3.33	10.1
7005-72-3	4-Chlorophenylphenylether	U	3.03	ug/L	3.03	10.1
100-02-7	4-Nitrophenol	U	3.03	ug/L	3.03	10.1
83-32-9	Acenaphthene	U	0.303	ug/L	0.303	1.01
208-96-8	Acenaphthylene	U	0.303	ug/L	0.303	1.01
62-53-3	Aniline	U	4.24	ug/L	4.24	10.1
120-12-7	Anthracene	U	0.303	ug/L	0.303	1.01
1912-24-9	Atrazine	U	3.03	ug/L	3.03	10.1
92-87-5	Benzidine	U	3.94	ug/L	3.94	10.1
56-55-3	Benzo(a)anthracene	U	0.303	ug/L	0.303	1.01
50-32-8	Benzo(a)pyrene	U	0.303	ug/L	0.303	1.01
205-99-2	Benzo(b)fluoranthene	U	0.303	ug/L	0.303	1.01
191-24-2	Benzo(ghi)perylene	U	0.303	ug/L	0.303	1.01

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

SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463007	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147650	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 16:25	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 990 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0316.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.303	ug/L	0.303	1.01
65-85-0	Benzoic acid	U	6.06	ug/L	6.06	20.2
100-51-6	Benzyl alcohol	U	3.03	ug/L	3.03	10.1
85-68-7	Butylbenzylphthalate	U	3.03	ug/L	3.03	10.1
218-01-9	Chrysene	U	0.303	ug/L	0.303	1.01
84-74-2	Di-n-butylphthalate	U	3.03	ug/L	3.03	10.1
117-84-0	Di-n-octylphthalate	U	3.03	ug/L	3.03	10.1
53-70-3	Dibenzo(a,h)anthracene	U	0.303	ug/L	0.303	1.01
132-64-9	Dibenzofuran	U	3.03	ug/L	3.03	10.1
84-66-2	Diethylphthalate	U	3.03	ug/L	3.03	10.1
131-11-3	Dimethylphthalate	U	3.03	ug/L	3.03	10.1
88-85-7	Dinoseb	U	3.03	ug/L	3.03	10.1
122-39-4	Diphenylamine	U	3.03	ug/L	3.03	10.1
206-44-0	Fluoranthene	U	0.303	ug/L	0.303	1.01
86-73-7	Fluorene	U	0.303	ug/L	0.303	1.01
118-74-1	Hexachlorobenzene	U	3.03	ug/L	3.03	10.1
87-68-3	Hexachlorobutadiene	U	3.03	ug/L	3.03	10.1
77-47-4	Hexachlorocyclopentadiene	U	3.03	ug/L	3.03	10.1
67-72-1	Hexachloroethane	U	3.03	ug/L	3.03	10.1
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.303	ug/L	0.303	1.01
78-59-1	Isophorone	U	3.54	ug/L	3.54	10.1
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.03	ug/L	3.03	10.1
924-16-3	N-Nitrosodi-n-butylamine	U	3.03	ug/L	3.03	10.1
55-18-5	N-Nitrosodiethylamine	U	3.03	ug/L	3.03	10.1
621-64-7	N-Nitrosodi--n-propylamine	U	3.03	ug/L	3.03	10.1
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.03	ug/L	3.03	10.1
91-20-3	Naphthalene	U	0.303	ug/L	0.303	1.01
98-95-3	Nitrobenzene	U	3.03	ug/L	3.03	10.1
608-93-5	Pentachlorobenzene	U	3.03	ug/L	3.03	10.1
87-86-5	Pentachlorophenol	U	3.03	ug/L	3.03	10.1
85-01-8	Phenanthrene	U	0.303	ug/L	0.303	1.01
108-95-2	Phenol	U	3.03	ug/L	3.03	10.1
129-00-0	Pyrene	U	0.303	ug/L	0.303	1.01
110-86-1	Pyridine	U	3.03	ug/L	3.03	10.1
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.03	ug/L	3.03	10.1
111-91-1	bis(2-Chloroethoxy)methane	U	3.03	ug/L	3.03	10.1
111-44-4	bis(2-Chloroethyl) ether	U	3.03	ug/L	3.03	10.1
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.03	ug/L	3.03	10.1

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Sample Summary**

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SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463007	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147650	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 16:25	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 990 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0316.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.74	ug/L	3.74	10.1
99-09-2	3-Nitroaniline	U	3.03	ug/L	3.03	10.1
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.03	ug/L	3.03	10.1
88-74-4	2-Nitroaniline	U	3.03	ug/L	3.03	10.1
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.03	ug/L	3.03	10.1
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	77.7	101	ug/L	77	(32%-124%)
2-Fluorobiphenyl	34.8	50.5	ug/L	69	(32%-112%)
2-Fluorophenol	35.1	101	ug/L	35	(15%-88%)
Nitrobenzene-d5	46.1	50.5	ug/L	91	(36%-115%)
Phenol-d5	22.8	101	ug/L	23	(15%-91%)
p-Terphenyl-d14	44.5	50.5	ug/L	88	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000075-09-2	Methylene Chloride	2.039	5.02	ug/L	93	NJ
000067-66-3	Trichloromethane	2.264	84.2	ug/L	97	NJ
000056-23-5	Carbon Tetrachloride	2.505	7.38	ug/L	90	NJ

**Semi-Volatile
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Sample Summary**

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SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463009	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147678	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 16:54	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 940 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0317.D	Column: DB-5ms	

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
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Sample Summary**

SDG Number:	2018-584	Date Collected:	10/25/2017 13:50	Matrix:	W
Lab Sample ID:	436463009	Date Received:	10/27/2017 08:55		
Client Sample:	VOA,SVOA	Client:	ARSL004	Project:	ESHL00114
Client ID:	CAMO-18-147678	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1714633	Inst:	MSD3.I	Dilution:	1
Run Date:	11/03/2017 16:54	Analyst:	JLD1	Inj. Vol:	1 uL
Prep Date:	11/01/2017 19:20	Aliquot:	940 mL	Final Volume:	1 mL
Data File:	s110317a.s\3k0317.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**

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SDG Number: 2018-584	Date Collected: 10/25/2017 13:50	Matrix: W
Lab Sample ID: 436463009	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147678	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 16:54	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 940 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0317.D	Column: DB-5ms	

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-Nitroaniline</i>					
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-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.19	ug/L	3.19	10.6
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	69.1	106	ug/L	65 (32%-124%)
2-Fluorobiphenyl	30.4	53.2	ug/L	57 (32%-112%)
2-Fluorophenol	42.1	106	ug/L	40 (15%-88%)
Nitrobenzene-d5	40.2	53.2	ug/L	76 (36%-115%)
Phenol-d5	28.7	106	ug/L	27 (15%-91%)
p-Terphenyl-d14	36.2	53.2	ug/L	68 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.264	73.6	ug/L	97	NJ
000056-23-5	Carbon Tetrachloride	2.505	5.59	ug/L	87	NJ

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

SDG Number: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463012	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147683	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 17:24	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 980 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0318.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	3.06	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	3.06	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
122-66-7	Azobenzene	U	3.06	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	3.06	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	J	3.61	ug/L	3.06	10.2
90-12-0	1-Methylnaphthalene	U	0.306	ug/L	0.306	1.02
58-90-2	2,3,4,6-Tetrachlorophenol	U	3.06	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	3.06	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	3.06	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	3.06	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	3.06	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	5.10	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	3.06	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	3.06	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	0.418	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	3.06	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	3.06	ug/L	3.06	10.2
91-57-6	2-Methylnaphthalene	U	0.306	ug/L	0.306	1.02
88-75-5	2-Nitrophenol	U	3.06	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	3.06	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	3.06	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	3.06	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	3.37	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	3.06	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	3.06	ug/L	3.06	10.2
83-32-9	Acenaphthene	U	0.306	ug/L	0.306	1.02
208-96-8	Acenaphthylene	U	0.306	ug/L	0.306	1.02
62-53-3	Aniline	U	4.29	ug/L	4.29	10.2
120-12-7	Anthracene	U	0.306	ug/L	0.306	1.02
1912-24-9	Atrazine	U	3.06	ug/L	3.06	10.2
92-87-5	Benzidine	U	3.98	ug/L	3.98	10.2
56-55-3	Benzo(a)anthracene	U	0.306	ug/L	0.306	1.02
50-32-8	Benzo(a)pyrene	U	0.306	ug/L	0.306	1.02
205-99-2	Benzo(b)fluoranthene	U	0.306	ug/L	0.306	1.02
191-24-2	Benzo(ghi)perylene	U	0.306	ug/L	0.306	1.02

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

SDG Number: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463012	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147683	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 17:24	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 980 mL	Final Volume: 1 mL
Data File: s110317a.s\3k0318.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	U	0.306	ug/L	0.306	1.02
65-85-0	Benzoic acid	U	6.12	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	3.06	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	3.06	ug/L	3.06	10.2
218-01-9	Chrysene	U	0.306	ug/L	0.306	1.02
84-74-2	Di-n-butylphthalate	U	3.06	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	3.06	ug/L	3.06	10.2
53-70-3	Dibenzo(a,h)anthracene	U	0.306	ug/L	0.306	1.02
132-64-9	Dibenzofuran	U	3.06	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	3.06	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	3.06	ug/L	3.06	10.2
88-85-7	Dinoseb	U	3.06	ug/L	3.06	10.2
122-39-4	Diphenylamine	U	3.06	ug/L	3.06	10.2
206-44-0	Fluoranthene	U	0.306	ug/L	0.306	1.02
86-73-7	Fluorene	U	0.306	ug/L	0.306	1.02
118-74-1	Hexachlorobenzene	U	3.06	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	3.06	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	3.06	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	3.06	ug/L	3.06	10.2
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.306	ug/L	0.306	1.02
78-59-1	Isophorone	U	3.57	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	3.06	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	3.06	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	3.06	ug/L	3.06	10.2
621-64-7	N-Nitrosodi--n-propylamine	U	3.06	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	3.06	ug/L	3.06	10.2
91-20-3	Naphthalene	U	0.306	ug/L	0.306	1.02
98-95-3	Nitrobenzene	U	3.06	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	3.06	ug/L	3.06	10.2
87-86-5	Pentachlorophenol	U	3.06	ug/L	3.06	10.2
85-01-8	Phenanthrene	U	0.306	ug/L	0.306	1.02
108-95-2	Phenol	U	3.06	ug/L	3.06	10.2
129-00-0	Pyrene	U	0.306	ug/L	0.306	1.02
110-86-1	Pyridine	U	3.06	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	3.06	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	3.06	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	3.06	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	3.06	ug/L	3.06	10.2

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

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SDG Number: 2018-584	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 436463012	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA	Client: ARSL004	Project: ESHL00114
Client ID: CAMO-18-147683	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/03/2017 17:24	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 980 mL	Final Volume: 1 mL
Data File: s110317a.s\s3k0318.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	U	3.78	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	3.06	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	3.06	ug/L	3.06	10.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	60.9	102	ug/L	60 (32%-124%)
2-Fluorobiphenyl	27.3	51.0	ug/L	53 (32%-112%)
2-Fluorophenol	40.2	102	ug/L	39 (15%-88%)
Nitrobenzene-d5	38.1	51.0	ug/L	75 (36%-115%)
Phenol-d5	26.8	102	ug/L	26 (15%-91%)
p-Terphenyl-d14	29.8	51.0	ug/L	58 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.259	72.1	ug/L	95	NJ
000056-23-5	Carbon Tetrachloride	2.5	5.49	ug/L	90	NJ

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

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SDG Number: 2018-584
Lab Sample ID: 436463015
Client Sample: VOA,SVOA
Client ID: CAPA-18-147581
Batch ID: 1714633
Run Date: 11/03/2017 17:53
Prep Date: 11/01/2017 19:20
Data File: s110317a.s\s3k0319.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 930 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
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: 2018-584
Lab Sample ID: 436463015
Client Sample: VOA,SVOA
Client ID: CAPA-18-147581
Batch ID: 1714633
Run Date: 11/03/2017 17:53
Prep Date: 11/01/2017 19:20
Data File: s110317a.s\s3k0319.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 930 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	0.323	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	J	7.60	ug/L	3.23	10.8

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

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SDG Number: 2018-584
Lab Sample ID: 436463015
Client Sample: VOA,SVOA
Client ID: CAPA-18-147581
Batch ID: 1714633
Run Date: 11/03/2017 17:53
Prep Date: 11/01/2017 19:20
Data File: s110317a.s\s3k0319.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 930 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	3.98	ug/L	3.98	10.8
99-09-2	3-Nitroaniline	U	3.23	ug/L	3.23	10.8
95-48-7	<i>m</i> -Nitroaniline 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
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.23	ug/L	3.23	10.8

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	66.8	108	ug/L 62	(32%-124%)
2-Fluorobiphenyl	30.8	53.8	ug/L 57	(32%-112%)
2-Fluorophenol	46.3	108	ug/L 43	(15%-88%)
Nitrobenzene-d5	40.6	53.8	ug/L 76	(36%-115%)
Phenol-d5	31.8	108	ug/L 30	(15%-91%)
p-Terphenyl-d14	32.0	53.8	ug/L 60	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000075-09-2	Methylene Chloride	2.04	4.72	ug/L	90	NJ
000067-66-3	Trichloromethane	2.248	79.3	ug/L	96	NJ
000056-23-5	Carbon Tetrachloride	2.489	6.69	ug/L	86	NJ
000080-05-7	Phenol, 4,4'-(1-methylethylidene)b	13.807	44.5	ug/L	98	NJ
	unknown	17.845	6.73	ug/L	0	J

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

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SDG Number: 2018-584

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203909249	MB for batch 1714631	51	32	100	77	88	91
1203909250	LCS for batch 1714631	45	29	77	74	83	77
436463003	CAPA-18-147576	39	25	78	62	68	81
1203909251	CAPA-18-147576MS	55	45	74	65	75	68
1203909252	CAPA-18-147576MSD	47	40	62	56	63	63
436463007	CAMO-18-147650	35	23	91	69	77	88
436463009	CAMO-18-147678	40	27	76	57	65	68
436463012	CAMO-18-147683	39	26	75	53	60	58
436463015	CAPA-18-147581	43	30	76	57	62	60

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

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SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714631

Matrix: WATER

Lab Sample ID 1203909250

Instrument: MSD3.I

Analysis Date: 11/02/2017 12:59

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	LCS N-Methyl-N-nitrosomethylam	50.0	0.0	24.9	50	30-88
110-86-1	LCS Pyridine	50.0	0.0	26.3	53	27-89
62-53-3	LCS Aniline	50.0	0.0	35.9	72	49-112
108-95-2	LCS Phenol	50.0	0.0	15.3	31	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	39.9	80	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	38.0	76	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	32.0	64	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	32.7	65	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	33.5	67	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	34.4	69	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	32.3	65	44-102
95-48-7	LCS o-Cresol	50.0	0.0	34.1	68	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	34.5	69	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	43.7	87	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	31.0	62	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	41.4	83	53-115
78-59-1	LCS Isophorone	50.0	0.0	41.5	83	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	39.5	79	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	30.9	62	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	40.0	80	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	40.0	80	53-109
65-85-0	LCS Benzoic acid	100	0.0	25.8	26	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714631

Matrix: WATER

Lab Sample ID 1203909250

Instrument: MSD3.I

Analysis Date: 11/02/2017 12:59

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	44.8	90	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	34.7	69	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	43.3	87	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	34.4	69	42-103
91-20-3	LCS Naphthalene	50.0	0.0	34.4	69	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	35.1	70	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	22.5	45	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	42.6	85	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	42.1	84	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	37.1	74	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	43.0	86	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	50.0	100	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	45.4	91	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	46.1	92	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	49.3	99	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	40.2	80	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	40.3	81	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	37.3	75	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	40.4	81	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	39.7	79	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	46.2	92	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	12.2	24	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714631

Matrix: WATER

Lab Sample ID 1203909250

Instrument: MSD3.I

Analysis Date: 11/02/2017 12:59

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	42.2	84	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	44.4	89	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	45.2	90	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	41.7	83	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	40.8	82	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	41.6	83	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	40.0	80	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	40.8	82	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	41.1	82	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	41.6	83	55-110
120-12-7	LCS Anthracene	50.0	0.0	41.5	83	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	43.1	86	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	45.1	90	54-118
129-00-0	LCS Pyrene	50.0	0.0	38.8	78	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	39.8	80	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	38.1	76	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	42.1	84	57-112
218-01-9	LCS Chrysene	50.0	0.0	42.2	84	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	44.0	88	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	40.5	81	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	41.3	83	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	40.8	82	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1714631

Matrix: WATER

Lab Sample ID 1203909250

Instrument: MSD3.I

Analysis Date: 11/02/2017 12:59

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	36.5	73	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	38.4	77	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	35.9	72	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	26.8	54	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	41.3	83	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	42.0	84	44-102
1912-24-9	LCS Atrazine	50.0	0.0	47.2	94	60-131
92-87-5	LCS Benzidine	100	0.0	105	105	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	61.1	122	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	33.5	67	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 8

SDG Number: 2018-584

Sample Type: Matrix Spike

Client ID: CAPA-18-147576MS

Matrix: W

Lab Sample ID 1203909251

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:28

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
62-75-9	MS N-Methyl-N-nitrosomethylam	125	0.00 U	75.9	61	25-106
110-86-1	MS Pyridine	125	0.00 U	77.1	62	24-93
62-53-3	MS Aniline	125	0.00 U	90.8	73	37-113
108-95-2	MS Phenol	125	0.00 U	60.2	48	23-82
111-44-4	MS bis(2-Chloroethyl) ether	125	0.00 U	87.3	70	39-114
95-57-8	MS 2-Chlorophenol	125	0.00 U	87.0	70	37-108
541-73-1	MS 1,3-Dichlorobenzene	125	0.00 U	67.0	54	27-97
106-46-7	MS 1,4-Dichlorobenzene	125	0.00 U	67.1	54	28-97
95-50-1	MS 1,2-Dichlorobenzene	125	0.00 U	68.1	54	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	125	0.00 U	77.1	62	32-127
100-51-6	MS Benzyl alcohol	125	0.00 U	83.9	67	37-116
95-48-7	MS o-Cresol	125	0.00 U	84.0	67	34-109
65794-96-9	MS m,p-Cresols	125	0.00 U	90.2	72	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	125	0.00 U	97.5	78	42-118
67-72-1	MS Hexachloroethane	125	0.00 U	65.0	52	29-94
98-95-3	MS Nitrobenzene	125	0.00 U	103	82	38-123
78-59-1	MS Isophorone	125	0.00 U	100	80	43-120
88-75-5	MS 2-Nitrophenol	125	0.00 U	97.0	78	39-115
105-67-9	MS 2,4-Dimethylphenol	125	0.00 U	73.2	59	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	125	0.00 U	97.3	78	42-118
120-83-2	MS 2,4-Dichlorophenol	125	0.00 U	96.8	77	40-111
65-85-0	MS Benzoic acid	250	0.00 U	119	48	17-95

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike

Client ID: CAPA-18-147576MS

Matrix: W

Lab Sample ID 1203909251

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:28

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	125	0.00	U	114	91	44-138
87-68-3	MS	Hexachlorobutadiene	125	0.00	U	77.3	62	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	125	0.00	U	109	87	41-122
91-57-6	MS	2-Methylnaphthalene	125	0.00	U	79.6	64	29-109
91-20-3	MS	Naphthalene	125	0.00	U	80.0	64	31-108
90-12-0	MS	1-Methylnaphthalene	125	0.00	U	80.5	64	33-112
77-47-4	MS	Hexachlorocyclopentadiene	125	0.00	U	50.0	40	26-79
88-06-2	MS	2,4,6-Trichlorophenol	125	0.00	U	95.6	77	39-124
95-95-4	MS	2,4,5-Trichlorophenol	125	0.00	U	97.5	78	42-120
91-58-7	MS	2-Chloronaphthalene	125	0.00	U	79.9	64	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	125	0.00	U	103	83	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	125	0.00	U	125	100	42-144
131-11-3	MS	Dimethylphthalate	125	0.00	U	103	83	45-128
606-20-2	MS	2,6-Dinitrotoluene	125	0.00	U	106	85	46-124
121-14-2	MS	2,4-Dinitrotoluene	125	0.00	U	119	95	45-125
208-96-8	MS	Acenaphthylene	125	0.00	U	88.5	71	35-120
83-32-9	MS	Acenaphthene	125	0.00	U	87.6	70	35-117
51-28-5	MS	2,4-Dinitrophenol	125	0.00	U	93.2	75	27-122
132-64-9	MS	Dibenzofuran	125	0.00	U	91.7	73	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	125	0.00	U	92.3	74	40-128
84-66-2	MS	Diethylphthalate	125	0.00	U	107	86	43-127
100-02-7	MS	4-Nitrophenol	125	0.00	U	58.4	47	17-85

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike

Client ID: CAPA-18-147576MS

Matrix: W

Lab Sample ID 1203909251

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:28

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	125	0.00	U	95.9	77	39-117
7005-72-3	MS	4-Chlorophenylphenylether	125	0.00	U	98.9	79	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	125	0.00	U	114	91	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	125	0.00	U	95.7	77	32-126
122-39-4	MS	Diphenylamine	125	0.00	U	81.5	65	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	125	0.00	U	93.6	75	38-120
101-55-3	MS	4-Bromophenylphenylether	125	0.00	U	88.6	71	39-121
118-74-1	MS	Hexachlorobenzene	125	0.00	U	87.4	70	40-118
87-86-5	MS	Pentachlorophenol	125	0.00	U	92.5	74	35-121
85-01-8	MS	Phenanthrene	125	0.00	U	93.4	75	40-115
120-12-7	MS	Anthracene	125	0.00	U	90.5	72	38-120
84-74-2	MS	Di-n-butylphthalate	125	0.00	U	93.5	75	41-128
206-44-0	MS	Fluoranthene	125	0.00	U	100	80	41-119
129-00-0	MS	Pyrene	125	0.00	U	86.8	69	35-128
85-68-7	MS	Butylbenzylphthalate	125	0.00	U	91.9	74	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	125	0.00	U	87.5	70	38-131
56-55-3	MS	Benzo(a)anthracene	125	0.00	U	96.0	77	39-120
218-01-9	MS	Chrysene	125	0.00	U	95.9	77	41-124
117-84-0	MS	Di-n-octylphthalate	125	0.00	U	104	83	37-134
205-99-2	MS	Benzo(b)fluoranthene	125	0.00	U	89.8	72	31-122
207-08-9	MS	Benzo(k)fluoranthene	125	0.00	U	89.5	72	33-123
50-32-8	MS	Benzo(a)pyrene	125	0.00	U	93.9	75	32-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike

Client ID: CAPA-18-147576MS

Matrix: W

Lab Sample ID 1203909251

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:28

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	125	0.00 U	99.8	80	27-121
53-70-3	MS Dibenzo(a,h)anthracene	125	0.00 U	102	82	30-125
191-24-2	MS Benzo(ghi)perylene	125	0.00 U	100	80	24-126
123-91-1	MS 1,4-Dioxane	125	0.00 U	80.5	64	24-110
930-55-2	MS N-Nitrosopyrrolidine	125	0.00 U	100	80	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	125	0.00 U	85.9	69	32-101
1912-24-9	MS Atrazine	125	0.00 U	103	82	42-129
92-87-5	MS Benzidine	250	0.00 U	233	93	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	125	0.00 U	127	102	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	125	0.00 U	75.1	60	26-102

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147576MSD

Matrix: W

Lab Sample ID 1203909252

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylam	125	0.00 U	67.4	54	25-106	12	0-30
110-86-1	MSD Pyridine	125	0.00 U	68.0	54	24-93	13	0-30
62-53-3	MSD Aniline	125	0.00 U	83.1	67	37-113	9	0-30
108-95-2	MSD Phenol	125	0.00 U	53.5	43	23-82	12	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	125	0.00 U	74.9	60	39-114	15	0-30
95-57-8	MSD 2-Chlorophenol	125	0.00 U	74.5	60	37-108	15	0-30
541-73-1	MSD 1,3-Dichlorobenzene	125	0.00 U	54.8	44	27-97	20	0-30
106-46-7	MSD 1,4-Dichlorobenzene	125	0.00 U	54.9	44	28-97	20	0-30
95-50-1	MSD 1,2-Dichlorobenzene	125	0.00 U	56.9	46	28-99	18	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	125	0.00 U	65.9	53	32-127	16	0-30
100-51-6	MSD Benzyl alcohol	125	0.00 U	74.9	60	37-116	11	0-30
95-48-7	MSD o-Cresol	125	0.00 U	74.4	60	34-109	12	0-30
65794-96-9	MSD m,p-Cresols	125	0.00 U	80.6	64	36-120	11	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	125	0.00 U	83.2	67	42-118	16	0-30
67-72-1	MSD Hexachloroethane	125	0.00 U	52.5	42	29-94	21	0-30
98-95-3	MSD Nitrobenzene	125	0.00 U	82.6	66	38-123	22	0-30
78-59-1	MSD Isophorone	125	0.00 U	81.7	65	43-120	20	0-30
88-75-5	MSD 2-Nitrophenol	125	0.00 U	79.5	64	39-115	20	0-30
105-67-9	MSD 2,4-Dimethylphenol	125	0.00 U	60.3	48	39-107	19	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	125	0.00 U	80.8	65	42-118	19	0-30
120-83-2	MSD 2,4-Dichlorophenol	125	0.00 U	78.4	63	40-111	21	0-30
65-85-0	MSD Benzoic acid	250	0.00 U	97.4	39	17-95	20	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147576MSD

Matrix: W

Lab Sample ID 1203909252

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	125	0.00 U	102	81	44-138	12	0-30
87-68-3	MSD Hexachlorobutadiene	125	0.00 U	58.9	47	26-98	27	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	125	0.00 U	88.5	71	41-122	21	0-30
91-57-6	MSD 2-Methylnaphthalene	125	0.00 U	62.8	50	29-109	24	0-30
91-20-3	MSD Naphthalene	125	0.00 U	64.8	52	31-108	21	0-30
90-12-0	MSD 1-Methylnaphthalene	125	0.00 U	63.3	51	33-112	24	0-30
77-47-4	MSD Hexachlorocyclopentadiene	125	0.00 U	37.7	30	26-79	28	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	125	0.00 U	78.9	63	39-124	19	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	125	0.00 U	80.8	65	42-120	19	0-30
91-58-7	MSD 2-Chloronaphthalene	125	0.00 U	67.6	54	29-113	17	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	125	0.00 U	87.4	70	41-121	17	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	125	0.00 U	112	90	42-144	11	0-30
131-11-3	MSD Dimethylphthalate	125	0.00 U	87.7	70	45-128	17	0-30
606-20-2	MSD 2,6-Dinitrotoluene	125	0.00 U	89.9	72	46-124	17	0-30
121-14-2	MSD 2,4-Dinitrotoluene	125	0.00 U	101	81	45-125	16	0-30
208-96-8	MSD Acenaphthylene	125	0.00 U	74.8	60	35-120	17	0-30
83-32-9	MSD Acenaphthene	125	0.00 U	72.0	58	35-117	20	0-30
51-28-5	MSD 2,4-Dinitrophenol	125	0.00 U	77.1	62	27-122	19	0-30
132-64-9	MSD Dibenzofuran	125	0.00 U	76.5	61	38-113	18	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	125	0.00 U	77.6	62	40-128	17	0-30
84-66-2	MSD Diethylphthalate	125	0.00 U	90.3	72	43-127	17	0-30
100-02-7	MSD 4-Nitrophenol	125	0.00 U	52.6	42	17-85	10	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147576MSD

Matrix: W

Lab Sample ID 1203909252

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

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	125	0.00 U	80.4	64	39-117	18	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	125	0.00 U	82.2	66	39-121	18	0-30
100-01-6	MSD 4-Nitroaniline <i>p-Nitroaniline</i>	125	0.00 U	94.8	76	30-133	18	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	125	0.00 U	83.1	67	32-126	14	0-30
122-39-4	MSD Diphenylamine	125	0.00 U	68.3	55	37-118	18	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	125	0.00 U	80.7	65	38-120	15	0-30
101-55-3	MSD 4-Bromophenylphenylether	125	0.00 U	74.6	60	39-121	17	0-30
118-74-1	MSD Hexachlorobenzene	125	0.00 U	75.5	60	40-118	15	0-30
87-86-5	MSD Pentachlorophenol	125	0.00 U	79.3	63	35-121	15	0-30
85-01-8	MSD Phenanthrene	125	0.00 U	81.4	65	40-115	14	0-30
120-12-7	MSD Anthracene	125	0.00 U	80.3	64	38-120	12	0-30
84-74-2	MSD Di-n-butylphthalate	125	0.00 U	83.9	67	41-128	11	0-30
206-44-0	MSD Fluoranthene	125	0.00 U	86.3	69	41-119	15	0-30
129-00-0	MSD Pyrene	125	0.00 U	79.3	63	35-128	9	0-30
85-68-7	MSD Butylbenzylphthalate	125	0.00 U	81.3	65	40-129	12	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	125	0.00 U	75.6	61	38-131	15	0-30
56-55-3	MSD Benzo(a)anthracene	125	0.00 U	81.6	65	39-120	16	0-30
218-01-9	MSD Chrysene	125	0.00 U	81.0	65	41-124	17	0-30
117-84-0	MSD Di-n-octylphthalate	125	0.00 U	85.7	69	37-134	19	0-30
205-99-2	MSD Benzo(b)fluoranthene	125	0.00 U	79.3	63	31-122	12	0-30
207-08-9	MSD Benzo(k)fluoranthene	125	0.00 U	79.5	64	33-123	12	0-30
50-32-8	MSD Benzo(a)pyrene	125	0.00 U	80.6	65	32-118	15	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 8 of 8

SDG Number: 2018-584

Sample Type: Matrix Spike Duplicate

Client ID: CAPA-18-147576MSD

Matrix: W

Lab Sample ID 1203909252

Instrument: MSD3.I

Analysis Date: 11/02/2017 14:56

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1714631

Inj. Vol: 1 uL

Batch ID: 1714633

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	125	0.00	U	78.9	63	27-121	23	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	125	0.00	U	81.3	65	30-125	23	0-30
191-24-2	MSD Benzo(ghi)perylene	125	0.00	U	78.4	63	24-126	25	0-30
123-91-1	MSD 1,4-Dioxane	125	0.00	U	70.0	56	24-110	14	0-30
930-55-2	MSD N-Nitrosopyrrolidine	125	0.00	U	88.4	71	47-119	12	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	125	0.00	U	69.8	56	32-101	21	0-30
1912-24-9	MSD Atrazine	125	0.00	U	93.0	74	42-129	10	0-30
92-87-5	MSD Benzidine	250	0.00	U	201	81	15-130	15	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	125	0.00	U	103	82	34-124	21	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	125	0.00	U	58.0	46	26-102	26	0-30

Method Blank Summary

Page 1 of 1

SDG Number:	2018-584	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1714631	Instrument ID:	MSD3.I	Data File:	s110217.s\s3h0209.D
Lab Sample ID:	1203909249	Prep Date:	11/01/2017 19:20	Analyzed:	11/02/17 12:25
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 1714631	1203909250	s110217.s\s3h0210.D	11/02/17	1259
02 CAPA-18-147576	436463003	s110217.s\s3h0212.D	11/02/17	1358
03 CAPA-18-147576MS	1203909251	s110217.s\s3h0213.D	11/02/17	1428
04 CAPA-18-147576MSD	1203909252	s110217.s\s3h0214.D	11/02/17	1456
05 CAMO-18-147650	436463007	s110317a.s\s3k0316.D	11/03/17	1625
06 CAMO-18-147678	436463009	s110317a.s\s3k0317.D	11/03/17	1654
07 CAMO-18-147683	436463012	s110317a.s\s3k0318.D	11/03/17	1724
08 CAPA-18-147581	436463015	s110317a.s\s3k0319.D	11/03/17	1753

Quality Control Data

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

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SDG Number: 2018-584

Lab Sample ID: 1203909249

Client Sample: QC for batch 1714631

Client ID: MB for batch 1714631

Batch ID: 1714633

Run Date: 11/02/2017 12:25

Prep Date: 11/01/2017 19:20

Data File: s110217.s\s3h0209.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

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
90-12-0	1-Methylnaphthalene	U	0.300	ug/L	0.300	1.00
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
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**

SDG Number: 2018-584

Matrix: WATER

Lab Sample ID: 1203909249

Client Sample: QC for batch 1714631

Client: ARSL004

Project: QC

Client ID: MB for batch 1714631

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1714633

Inst: MSD3.I

Dilution: 1

Run Date: 11/02/2017 12:25

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 11/01/2017 19:20

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s110217.s\s3h0209.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: 2018-584	Matrix: WATER
Lab Sample ID: 1203909249	
Client Sample: QC for batch 1714631	Client: ARSL004
Client ID: MB for batch 1714631	Method: SW846 3510C/8270D
Batch ID: 1714633	Inst: MSD3.I
Run Date: 11/02/2017 12:25	Analyst: JLD1
Prep Date: 11/01/2017 19:20	Aliquot: 1000 mL
Data File: s110217.s\s3h0209.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	88.2	100	ug/L	88 (32%-124%)
2-Fluorobiphenyl	38.4	50.0	ug/L	77 (32%-112%)
2-Fluorophenol	51.2	100	ug/L	51 (15%-88%)
Nitrobenzene-d5	49.9	50.0	ug/L	100 (36%-115%)
Phenol-d5	32.4	100	ug/L	32 (15%-91%)
p-Terphenyl-d14	45.4	50.0	ug/L	91 (36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.093	95.2	ug/L	95	NJ
000056-23-5	Carbon Tetrachloride	2.329	7.71	ug/L	91	NJ

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

Page 1 of 3

SDG Number: 2018-584

Lab Sample ID: 1203909250

Client Sample: QC for batch 1714631

Client ID: LCS for batch 1714631

Batch ID: 1714633

Run Date: 11/02/2017 12:59

Prep Date: 11/01/2017 19:20

Data File: s110217.s\s3h0210.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD3.I
Analyst: JLD1
Aliquot: 1000 mL
Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		35.1	ug/L	0.300	1.00
95-94-3	1,2,4,5-Tetrachlorobenzene		42.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		33.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		33.5	ug/L	3.00	10.0
122-66-7	Azobenzene		41.6	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		32.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		32.7	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		26.8	ug/L	3.00	10.0
58-90-2	2,3,4,6-Tetrachlorophenol		39.7	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		42.1	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		42.6	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		40.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		30.9	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		37.3	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		49.3	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		46.1	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		37.1	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		38.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		41.7	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		34.4	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		39.5	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		61.1	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		40.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		43.3	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		44.8	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		44.4	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		12.2	ug/L	3.00	10.0
83-32-9	Acenaphthene		40.3	ug/L	0.300	1.00
208-96-8	Acenaphthylene		40.2	ug/L	0.300	1.00
62-53-3	Aniline		35.9	ug/L	4.20	10.0
120-12-7	Anthracene		41.5	ug/L	0.300	1.00
1912-24-9	Atrazine		47.2	ug/L	3.00	10.0
92-87-5	Benzidine	E	105	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		42.1	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		40.8	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		40.5	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		35.9	ug/L	0.300	1.00

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

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SDG Number: 2018-584

Lab Sample ID: 1203909250

Client Sample: QC for batch 1714631

Client ID: LCS for batch 1714631

Batch ID: 1714633

Run Date: 11/02/2017 12:59

Prep Date: 11/01/2017 19:20

Data File: s110217.s\s3h0210.D

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

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		41.3	ug/L	0.300	1.00
65-85-0	Benzoic acid		25.8	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		32.3	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		39.8	ug/L	3.00	10.0
218-01-9	Chrysene		42.2	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		43.1	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		44.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		38.4	ug/L	0.300	1.00
132-64-9	Dibenzofuran		40.4	ug/L	3.00	10.0
84-66-2	Diethylphthalate		46.2	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		45.4	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		40.8	ug/L	3.00	10.0
206-44-0	Fluoranthene		45.1	ug/L	0.300	1.00
86-73-7	Fluorene		42.2	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		40.8	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		34.7	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		22.5	ug/L	3.00	10.0
67-72-1	Hexachloroethane		31.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		36.5	ug/L	0.300	1.00
78-59-1	Isophorone		41.5	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		24.9	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		43.7	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		41.3	ug/L	3.00	10.0
91-20-3	Naphthalene		34.4	ug/L	0.300	1.00
98-95-3	Nitrobenzene		41.4	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		41.1	ug/L	3.00	10.0
85-01-8	Phenanthrene		41.6	ug/L	0.300	1.00
108-95-2	Phenol		15.3	ug/L	3.00	10.0
129-00-0	Pyrene		38.8	ug/L	0.300	1.00
110-86-1	Pyridine		26.3	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		34.4	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		40.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		39.9	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		38.1	ug/L	3.00	10.0

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

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SDG Number: 2018-584	Matrix: WATER
Lab Sample ID: 1203909250	
Client Sample: QC for batch 1714631	Client: ARSL004
Client ID: LCS for batch 1714631	Method: SW846 3510C/8270D
Batch ID: 1714633	Inst: MSD3.I
Run Date: 11/02/2017 12:59	Analyst: JLD1
Prep Date: 11/01/2017 19:20	Aliquot: 1000 mL
Data File: s110217.s\s3h0210.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		34.5	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		50.0	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		34.1	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		43.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		45.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	82.5	100	ug/L	83	(32%-124%)
2-Fluorobiphenyl	37.1	50.0	ug/L	74	(32%-112%)
2-Fluorophenol	45.5	100	ug/L	45	(15%-88%)
Nitrobenzene-d5	38.6	50.0	ug/L	77	(36%-115%)
Phenol-d5	28.7	100	ug/L	29	(15%-91%)
p-Terphenyl-d14	38.6	50.0	ug/L	77	(36%-121%)

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

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203909251	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1714631	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 14:28	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 400 mL	Final Volume: 1 mL
Data File: s110217.s\s3h0213.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		85.9	ug/L	7.50	25.0
120-82-1	1,2,4-Trichlorobenzene		75.1	ug/L	7.50	25.0
95-50-1	1,2-Dichlorobenzene		68.1	ug/L	7.50	25.0
122-66-7	Azobenzene		93.6	ug/L	7.50	25.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		67.0	ug/L	7.50	25.0
106-46-7	1,4-Dichlorobenzene		67.1	ug/L	7.50	25.0
123-91-1	1,4-Dioxane		80.5	ug/L	7.50	25.0
90-12-0	1-Methylnaphthalene		80.5	ug/L	0.750	2.50
58-90-2	2,3,4,6-Tetrachlorophenol		92.3	ug/L	7.50	25.0
95-95-4	2,4,5-Trichlorophenol		97.5	ug/L	7.50	25.0
88-06-2	2,4,6-Trichlorophenol		95.6	ug/L	7.50	25.0
120-83-2	2,4-Dichlorophenol		96.8	ug/L	7.50	25.0
105-67-9	2,4-Dimethylphenol		73.2	ug/L	7.50	25.0
51-28-5	2,4-Dinitrophenol		93.2	ug/L	12.5	50.0
121-14-2	2,4-Dinitrotoluene		119	ug/L	7.50	25.0
606-20-2	2,6-Dinitrotoluene		106	ug/L	7.50	25.0
91-58-7	2-Chloronaphthalene		79.9	ug/L	1.03	2.50
95-57-8	2-Chlorophenol		87.0	ug/L	7.50	25.0
534-52-1	2-Methyl-4,6-dinitrophenol		95.7	ug/L	7.50	25.0
91-57-6	2-Methylnaphthalene		79.6	ug/L	0.750	2.50
88-75-5	2-Nitrophenol		97.0	ug/L	7.50	25.0
91-94-1	3,3'-Dichlorobenzidine		127	ug/L	7.50	25.0
101-55-3	4-Bromophenylphenylether		88.6	ug/L	7.50	25.0
59-50-7	Parachlorometa cresol		109	ug/L	7.50	25.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		114	ug/L	8.25	25.0
7005-72-3	4-Chlorophenylphenylether		98.9	ug/L	7.50	25.0
100-02-7	4-Nitrophenol		58.4	ug/L	7.50	25.0
83-32-9	Acenaphthene		87.6	ug/L	0.750	2.50
208-96-8	Acenaphthylene		88.5	ug/L	0.750	2.50
62-53-3	Aniline		90.8	ug/L	10.5	25.0
120-12-7	Anthracene		90.5	ug/L	0.750	2.50
1912-24-9	Atrazine		103	ug/L	7.50	25.0
92-87-5	Benzidine		233	ug/L	9.75	25.0
56-55-3	Benzo(a)anthracene		96.0	ug/L	0.750	2.50
50-32-8	Benzo(a)pyrene		93.9	ug/L	0.750	2.50
205-99-2	Benzo(b)fluoranthene		89.8	ug/L	0.750	2.50
191-24-2	Benzo(ghi)perylene		100	ug/L	0.750	2.50

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

SDG Number:	2018-584	Date Collected:	10/25/2017 09:44	Matrix:	W
Lab Sample ID:	1203909251	Date Received:	10/27/2017 08:55		
Client Sample:	QC for batch 1714631	Client:	ARSL004	Project:	QC
Client ID:	CAPA-18-147576MS	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1714633	Inst:	MSD3.I	Dilution:	1
Run Date:	11/02/2017 14:28	Analyst:	JLD1	Inj. Vol:	1 uL
Prep Date:	11/01/2017 19:20	Aliquot:	400 mL	Final Volume:	1 mL
Data File:	s110217.s\s3h0213.D	Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		89.5	ug/L	0.750	2.50
65-85-0	Benzoic acid		119	ug/L	15.0	50.0
100-51-6	Benzyl alcohol		83.9	ug/L	7.50	25.0
85-68-7	Butylbenzylphthalate		91.9	ug/L	7.50	25.0
218-01-9	Chrysene		95.9	ug/L	0.750	2.50
84-74-2	Di-n-butylphthalate		93.5	ug/L	7.50	25.0
117-84-0	Di-n-octylphthalate		104	ug/L	7.50	25.0
53-70-3	Dibenzo(a,h)anthracene		102	ug/L	0.750	2.50
132-64-9	Dibenzofuran		91.7	ug/L	7.50	25.0
84-66-2	Diethylphthalate		107	ug/L	7.50	25.0
131-11-3	Dimethylphthalate		103	ug/L	7.50	25.0
88-85-7	Dinoseb	U	7.50	ug/L	7.50	25.0
122-39-4	Diphenylamine		81.5	ug/L	7.50	25.0
206-44-0	Fluoranthene		100	ug/L	0.750	2.50
86-73-7	Fluorene		95.9	ug/L	0.750	2.50
118-74-1	Hexachlorobenzene		87.4	ug/L	7.50	25.0
87-68-3	Hexachlorobutadiene		77.3	ug/L	7.50	25.0
77-47-4	Hexachlorocyclopentadiene		50.0	ug/L	7.50	25.0
67-72-1	Hexachloroethane		65.0	ug/L	7.50	25.0
193-39-5	Indeno(1,2,3-cd)pyrene		99.8	ug/L	0.750	2.50
78-59-1	Isophorone		100	ug/L	8.75	25.0
62-75-9	N-Methyl-N-nitrosomethylamine		75.9	ug/L	7.50	25.0
924-16-3	N-Nitrosodi-n-butylamine	U	7.50	ug/L	7.50	25.0
55-18-5	N-Nitrosodiethylamine	U	7.50	ug/L	7.50	25.0
621-64-7	N-Nitrosodi--n-propylamine		97.5	ug/L	7.50	25.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		100	ug/L	7.50	25.0
91-20-3	Naphthalene		80.0	ug/L	0.750	2.50
98-95-3	Nitrobenzene		103	ug/L	7.50	25.0
608-93-5	Pentachlorobenzene	U	7.50	ug/L	7.50	25.0
87-86-5	Pentachlorophenol		92.5	ug/L	7.50	25.0
85-01-8	Phenanthrene		93.4	ug/L	0.750	2.50
108-95-2	Phenol		60.2	ug/L	7.50	25.0
129-00-0	Pyrene		86.8	ug/L	0.750	2.50
110-86-1	Pyridine		77.1	ug/L	7.50	25.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		77.1	ug/L	7.50	25.0
111-91-1	bis(2-Chloroethoxy)methane		97.3	ug/L	7.50	25.0
111-44-4	bis(2-Chloroethyl) ether		87.3	ug/L	7.50	25.0
117-81-7	bis(2-Ethylhexyl)phthalate		87.5	ug/L	7.50	25.0

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

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SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203909251	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1714631	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 14:28	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 400 mL	Final Volume: 1 mL
Data File: s110217.s\s3h0213.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		90.2	ug/L	9.25	25.0
99-09-2	3-Nitroaniline		125	ug/L	7.50	25.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		84.0	ug/L	7.50	25.0
88-74-4	2-Nitroaniline		103	ug/L	7.50	25.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		114	ug/L	7.50	25.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	187	250	ug/L	75	(32%-124%)
2-Fluorobiphenyl	80.9	125	ug/L	65	(32%-112%)
2-Fluorophenol	137	250	ug/L	55	(15%-88%)
Nitrobenzene-d5	92.6	125	ug/L	74	(36%-115%)
Phenol-d5	111	250	ug/L	45	(15%-91%)
p-Terphenyl-d14	85.0	125	ug/L	68	(36%-121%)

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

Page 1 of 3

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203909252	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1714631	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 14:56	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 400 mL	Final Volume: 1 mL
Data File: s110217.s\s3h0214.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		69.8	ug/L	7.50	25.0
120-82-1	1,2,4-Trichlorobenzene		58.0	ug/L	7.50	25.0
95-50-1	1,2-Dichlorobenzene		56.9	ug/L	7.50	25.0
122-66-7	Azobenzene		80.7	ug/L	7.50	25.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		54.8	ug/L	7.50	25.0
106-46-7	1,4-Dichlorobenzene		54.9	ug/L	7.50	25.0
123-91-1	1,4-Dioxane		70.0	ug/L	7.50	25.0
90-12-0	1-Methylnaphthalene		63.3	ug/L	0.750	2.50
58-90-2	2,3,4,6-Tetrachlorophenol		77.6	ug/L	7.50	25.0
95-95-4	2,4,5-Trichlorophenol		80.8	ug/L	7.50	25.0
88-06-2	2,4,6-Trichlorophenol		78.9	ug/L	7.50	25.0
120-83-2	2,4-Dichlorophenol		78.4	ug/L	7.50	25.0
105-67-9	2,4-Dimethylphenol		60.3	ug/L	7.50	25.0
51-28-5	2,4-Dinitrophenol		77.1	ug/L	12.5	50.0
121-14-2	2,4-Dinitrotoluene		101	ug/L	7.50	25.0
606-20-2	2,6-Dinitrotoluene		89.9	ug/L	7.50	25.0
91-58-7	2-Chloronaphthalene		67.6	ug/L	1.03	2.50
95-57-8	2-Chlorophenol		74.5	ug/L	7.50	25.0
534-52-1	2-Methyl-4,6-dinitrophenol		83.1	ug/L	7.50	25.0
91-57-6	2-Methylnaphthalene		62.8	ug/L	0.750	2.50
88-75-5	2-Nitrophenol		79.5	ug/L	7.50	25.0
91-94-1	3,3'-Dichlorobenzidine		103	ug/L	7.50	25.0
101-55-3	4-Bromophenylphenylether		74.6	ug/L	7.50	25.0
59-50-7	Parachlorometa cresol		88.5	ug/L	7.50	25.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		102	ug/L	8.25	25.0
7005-72-3	4-Chlorophenylphenylether		82.2	ug/L	7.50	25.0
100-02-7	4-Nitrophenol		52.6	ug/L	7.50	25.0
83-32-9	Acenaphthene		72.0	ug/L	0.750	2.50
208-96-8	Acenaphthylene		74.8	ug/L	0.750	2.50
62-53-3	Aniline		83.1	ug/L	10.5	25.0
120-12-7	Anthracene		80.3	ug/L	0.750	2.50
1912-24-9	Atrazine		93.0	ug/L	7.50	25.0
92-87-5	Benzidine		201	ug/L	9.75	25.0
56-55-3	Benzo(a)anthracene		81.6	ug/L	0.750	2.50
50-32-8	Benzo(a)pyrene		80.6	ug/L	0.750	2.50
205-99-2	Benzo(b)fluoranthene		79.3	ug/L	0.750	2.50
191-24-2	Benzo(ghi)perylene		78.4	ug/L	0.750	2.50

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

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203909252	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1714631	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 14:56	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 400 mL	Final Volume: 1 mL
Data File: s110217.s\s3h0214.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene		79.5	ug/L	0.750	2.50
65-85-0	Benzoic acid		97.4	ug/L	15.0	50.0
100-51-6	Benzyl alcohol		74.9	ug/L	7.50	25.0
85-68-7	Butylbenzylphthalate		81.3	ug/L	7.50	25.0
218-01-9	Chrysene		81.0	ug/L	0.750	2.50
84-74-2	Di-n-butylphthalate		83.9	ug/L	7.50	25.0
117-84-0	Di-n-octylphthalate		85.7	ug/L	7.50	25.0
53-70-3	Dibenzo(a,h)anthracene		81.3	ug/L	0.750	2.50
132-64-9	Dibenzofuran		76.5	ug/L	7.50	25.0
84-66-2	Diethylphthalate		90.3	ug/L	7.50	25.0
131-11-3	Dimethylphthalate		87.7	ug/L	7.50	25.0
88-85-7	Dinoseb	U	7.50	ug/L	7.50	25.0
122-39-4	Diphenylamine		68.3	ug/L	7.50	25.0
206-44-0	Fluoranthene		86.3	ug/L	0.750	2.50
86-73-7	Fluorene		80.4	ug/L	0.750	2.50
118-74-1	Hexachlorobenzene		75.5	ug/L	7.50	25.0
87-68-3	Hexachlorobutadiene		58.9	ug/L	7.50	25.0
77-47-4	Hexachlorocyclopentadiene		37.7	ug/L	7.50	25.0
67-72-1	Hexachloroethane		52.5	ug/L	7.50	25.0
193-39-5	Indeno(1,2,3-cd)pyrene		78.9	ug/L	0.750	2.50
78-59-1	Isophorone		81.7	ug/L	8.75	25.0
62-75-9	N-Methyl-N-nitrosomethylamine		67.4	ug/L	7.50	25.0
924-16-3	N-Nitrosodi-n-butylamine	U	7.50	ug/L	7.50	25.0
55-18-5	N-Nitrosodiethylamine	U	7.50	ug/L	7.50	25.0
621-64-7	N-Nitrosodi--n-propylamine		83.2	ug/L	7.50	25.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		88.4	ug/L	7.50	25.0
91-20-3	Naphthalene		64.8	ug/L	0.750	2.50
98-95-3	Nitrobenzene		82.6	ug/L	7.50	25.0
608-93-5	Pentachlorobenzene	U	7.50	ug/L	7.50	25.0
87-86-5	Pentachlorophenol		79.3	ug/L	7.50	25.0
85-01-8	Phenanthrene		81.4	ug/L	0.750	2.50
108-95-2	Phenol		53.5	ug/L	7.50	25.0
129-00-0	Pyrene		79.3	ug/L	0.750	2.50
110-86-1	Pyridine		68.0	ug/L	7.50	25.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		65.9	ug/L	7.50	25.0
111-91-1	bis(2-Chloroethoxy)methane		80.8	ug/L	7.50	25.0
111-44-4	bis(2-Chloroethyl) ether		74.9	ug/L	7.50	25.0
117-81-7	bis(2-Ethylhexyl)phthalate		75.6	ug/L	7.50	25.0

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

Page 3 of 3

SDG Number: 2018-584	Date Collected: 10/25/2017 09:44	Matrix: W
Lab Sample ID: 1203909252	Date Received: 10/27/2017 08:55	
Client Sample: QC for batch 1714631	Client: ARSL004	Project: QC
Client ID: CAPA-18-147576MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1714633	Inst: MSD3.I	Dilution: 1
Run Date: 11/02/2017 14:56	Analyst: JLD1	Inj. Vol: 1 uL
Prep Date: 11/01/2017 19:20	Aliquot: 400 mL	Final Volume: 1 mL
Data File: s110217.s\s3h0214.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		80.6	ug/L	9.25	25.0
99-09-2	3-Nitroaniline		112	ug/L	7.50	25.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		74.4	ug/L	7.50	25.0
88-74-4	2-Nitroaniline		87.4	ug/L	7.50	25.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		94.8	ug/L	7.50	25.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	157	250	ug/L	63	(32%-124%)
2-Fluorobiphenyl	69.7	125	ug/L	56	(32%-112%)
2-Fluorophenol	118	250	ug/L	47	(15%-88%)
Nitrobenzene-d5	77.7	125	ug/L	62	(36%-115%)
Phenol-d5	101	250	ug/L	40	(15%-91%)
p-Terphenyl-d14	78.2	125	ug/L	63	(36%-121%)

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorates by LCMSMS
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-584
Work Order #: 436463**

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: 1714762

Prep Batch Number: 1714758

Sample Analysis

Sample ID	Client ID
436463001	436463001 (CAPA-18-147550)
436463005	436463005 (CAMO-18-147635)
436463010	436463010 (CAMO-18-147680)
436463013	436463013 (CAPA-18-147555)
1203909517	Interference Check Sample (ICS)
1203909513	Method Blank (MB)
1203909514	Laboratory Control Sample (LCS)
1203909515	436322001(CAPA-18-147551) Matrix Spike (MS)
1203909516	436322001(CAPA-18-147551) 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 436322001 (CAPA-18-147551) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard Area Acceptance

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

Retention Time

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

Technical Information

Holding Time Specifications

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

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Manual Integrations

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

Method Comments

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

Additional Comments

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

Perchlorate Isotope Ratio

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

System Configuration

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

Electronic Packaging Comment

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

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

Chromatographic Columns

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

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-584 GEL Work Order: 436463

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 22 NOV 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147550Date Received: 27-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 436463001Date Filtered: 01-NOV-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	0.442	ug/L		1	03-NOV-17 19:34	per1103021a
	Perchlorate Isotope Ratio			3.32			1	03-NOV-17 19:34	per1103021a
14797-73-0	Perchlorate-101	.05	.2	0.403	ug/L		1	03-NOV-17 19:34	per1103021a
	Perchlorate-O(18)			0.391	ug/L		1	03-NOV-17 19:34	per1103021a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147635Date Received: 27-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 436463005Date Filtered: 01-NOV-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	0.402	ug/L		1	03-NOV-17 19:44	per1103022a
	Perchlorate Isotope Ratio			3.28			1	03-NOV-17 19:44	per1103022a
14797-73-0	Perchlorate-101	.05	.2	0.372	ug/L		1	03-NOV-17 19:44	per1103022a
	Perchlorate-O(18)			0.382	ug/L		1	03-NOV-17 19:44	per1103022a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-18-147680Date Received: 27-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 436463010Date Filtered: 01-NOV-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	0.387	ug/L		1	03-NOV-17 20:26	per1103026a
	Perchlorate Isotope Ratio			2.94			1	03-NOV-17 20:26	per1103026a
14797-73-0	Perchlorate-101	.05	.2	0.399	ug/L		1	03-NOV-17 20:26	per1103026a
	Perchlorate-O(18)			0.352	ug/L		1	03-NOV-17 20:26	per1103026a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147555Date Received: 27-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 436463013Date Filtered: 01-NOV-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	0.346	ug/L		1	03-NOV-17 20:37	per1103027a
	Perchlorate Isotope Ratio			3.11			1	03-NOV-17 20:37	per1103027a
14797-73-0	Perchlorate-101	.05	.2	0.338	ug/L		1	03-NOV-17 20:37	per1103027a
	Perchlorate-O(18)			0.344	ug/L		1	03-NOV-17 20:37	per1103027a

^ 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): 2018-584

Extract Batch Code: 1714758

Date Filtered: 01-NOV-17

Matrix: WATER

Sample ID: 1203909514

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.187	ug/L	93		85 - 115
Perchlorate Isotope Ratio		2.7				-
Perchlorate-101	0.200	.21	ug/L	105		85 - 115
Perchlorate-O(18)		.411	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): 2018-584

Extract Batch Code: 1714758

Date Extracted: 01-NOV-17

GEL MS/PS ID: 1203909515

Client ID: CAPA-18-147551

GEL MSD/PSD ID: 1203909516

QC Type: MS

Compound^	Spike Added	Sample Conc	Units	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Recovery Limit
Perchlorate	0.200	0.237	ug/L	0.427	95	.48	121	12	30	75 - 125
Perchlorate Isotope Ratio	0	3.02		2.98		3.04		2		-
Perchlorate-101	0.200	0.238	ug/L	0.435	98	.478	120	9	30	75 - 125
Perchlorate-O(18)	0	0.401	ug/L	0.399		.399		0		-

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 01-NOV-17GEL Job No (SDG): 2018-584GEL Sample ID: 1203909513Date Filtered: 01-NOV-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	03-NOV-17 18:10	per1103013a
	Perchlorate Isotope Ratio						1	03-NOV-17 18:10	per1103013a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	03-NOV-17 18:10	per1103013a
	Perchlorate-O(18)			0.409	ug/L		1	03-NOV-17 18:10	per1103013a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 01-NOV-17GEL Job No (SDG): 2018-584GEL Sample ID: 1203909514Date Filtered: 01-NOV-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	0.187	ug/L	J	1	03-NOV-17 18:21	per1103014a
	Perchlorate Isotope Ratio			2.7			1	03-NOV-17 18:21	per1103014a
14797-73-0	Perchlorate-101	.05	.2	0.210	ug/L		1	03-NOV-17 18:21	per1103014a
	Perchlorate-O(18)			0.411	ug/L		1	03-NOV-17 18:21	per1103014a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2018-584GEL Sample ID: 1203909517Date Filtered: 01-NOV-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	0.233	ug/L		1	03-NOV-17 18:31	per1103015a
	Perchlorate Isotope Ratio			3.32			1	03-NOV-17 18:31	per1103015a
14797-73-0	Perchlorate-101	.05	.2	0.213	ug/L		1	03-NOV-17 18:31	per1103015a
	Perchlorate-O(18)			0.409	ug/L		1	03-NOV-17 18:31	per1103015a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147551MSDate Received: 26-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 1203909515Date Filtered: 01-NOV-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	0.427	ug/L		1	03-NOV-17 19:03	per1103018a
	Perchlorate Isotope Ratio			2.98			1	03-NOV-17 19:03	per1103018a
14797-73-0	Perchlorate-101	.05	.2	0.435	ug/L		1	03-NOV-17 19:03	per1103018a
	Perchlorate-O(18)			0.399	ug/L		1	03-NOV-17 19:03	per1103018a

^ 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: 1714758Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-18-147551MSDDate Received: 26-OCT-17GEL Job No (SDG): 2018-584GEL Sample ID: 1203909516Date Filtered: 01-NOV-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	0.480	ug/L		1	03-NOV-17 19:13	per1103019a
	Perchlorate Isotope Ratio			3.04			1	03-NOV-17 19:13	per1103019a
14797-73-0	Perchlorate-101	.05	.2	0.478	ug/L		1	03-NOV-17 19:13	per1103019a
	Perchlorate-O(18)			0.399	ug/L		1	03-NOV-17 19:13	per1103019a

^ 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 #: 2018-584
Work Order #: 436463

Sample ID	Client ID
436463001	CAPA-18-147550
436463002	CAPA-18-147576
436463005	CAMO-18-147635
436463006	CAMO-18-147650
436463010	CAMO-18-147680
436463011	CAMO-18-147683
436463013	CAPA-18-147555
436463014	CAPA-18-147581
1203906919	Method Blank (MB) ICP
1203906920	Laboratory Control Sample (LCS)
1203906923	436463001(CAPA-18-147550L) Serial Dilution (SD)
1203906921	436463001(CAPA-18-147550D) Sample Duplicate (DUP)
1203906922	436463001(CAPA-18-147550S) Matrix Spike (MS)
1203907097	Method Blank (MB) ICP-MS
1203907098	Laboratory Control Sample (LCS)
1203907101	436463001(CAPA-18-147550L) Serial Dilution (SD)
1203907099	436463001(CAPA-18-147550D) Sample Duplicate (DUP)
1203907100	436463001(CAPA-18-147550S) Matrix Spike (MS)
1203918388	Method Blank (MB) CVAA
1203918389	Laboratory Control Sample (LCS)
1203918392	436463001(CAPA-18-147550L) Serial Dilution (SD)
1203918390	436463001(CAPA-18-147550D) Sample Duplicate (DUP)
1203918391	436463001(CAPA-18-147550S) Matrix Spike (MS)

Sample Analysis

Samples 436463001,002,005,006,010,011,013 and 014 in this SDG were analyzed for metals and mercury on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1713802, 1713852, 1718336 and 1721549
Prep Batch :	1713801, 1713851 and 1718327
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 PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard.

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The PQL standard recoveries for SW846 6010C or 6010D met the control limits with the exception of potassium. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 436463001 (CAPA-18-147550), 436463005 (CAMO-18-147635), 436463010 (CAMO-18-147680) and 436463013 (CAPA-18-147555)-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: 436463001 (CAPA-18-147550)-ICP, ICP-MS and CVAA.

Matrix Spike (MS/MSD) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Serial Dilution % Difference Statement

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

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

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

Additional Comments

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-584 GEL Work Order: 436463

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: Kristen Mizzell

Date: 24 NOV 2017

Title: Team Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463001**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147550**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 10:58	111417W1-4	1718336

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436463001

BASIS: As Received

DATE COLLECTED 25-OCT-17

CLIENT ID: CAPA-18-147550

LEVEL: Low

DATE RECEIVED 27-OCT-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-38-2	Arsenic	2.16	ug/L	J	2	5	5	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-39-3	Barium	18.2	ug/L		1	5	5	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-70-2	Calcium	15600	ug/L		50	200	200	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-47-3	Chromium	4.65	ug/L	J	3	10	10	1	MS	BAJ	10/29/17 13:38	171029-3	1713852
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7439-95-4	Magnesium	3810	ug/L		110	300	300	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7439-98-7	Molybdenum	1.65	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/29/17 13:38	171029-3	1713852
7440-09-7	Potassium	1600	ug/L		50	150	150	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7631-86-9	Silica	57400	ug/L		53	213	213	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-23-5	Sodium	10000	ug/L		100	300	300	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-24-6	Strontium	76	ug/L		1	5	5	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-61-1	Uranium	0.414	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/28/17 23:31	171028-2	1713852
7440-62-2	Vanadium	5.82	ug/L		1	5	5	1	P	JWJ	11/22/17 14:32	112217A-1	1713802
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	11/22/17 14:32	112217A-1	1713802

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436463001**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147550**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	54.7	mg/L		0.453	1.24	1.24	1		TXT1	11/24/17 10:52		1721549

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1713802	1713801	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1713852	1713851	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463002**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147576**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:06	111417W1-4	1718336

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463005**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147635**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:08	111417W1-4	1718336

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436463005

BASIS: As Received

DATE COLLECTED 25-OCT-17

CLIENT ID: CAMO-18-147635

LEVEL: Low

DATE RECEIVED 27-OCT-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-38-2	Arsenic	2.59	ug/L	J	2	5	5	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-39-3	Barium	8.19	ug/L		1	5	5	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-42-8	Boron	24.2	ug/L	J	15	50	50	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-70-2	Calcium	24700	ug/L		50	200	200	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	10/29/17 13:45	171029-3	1713852
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7439-95-4	Magnesium	5590	ug/L		110	300	300	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7439-98-7	Molybdenum	2.69	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/29/17 13:45	171029-3	1713852
7440-09-7	Potassium	1690	ug/L		50	150	150	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7631-86-9	Silica	53400	ug/L		53	213	213	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-23-5	Sodium	14500	ug/L		100	300	300	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-24-6	Strontium	104	ug/L		1	5	5	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-61-1	Uranium	1.44	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/28/17 23:57	171028-2	1713852
7440-62-2	Vanadium	4.18	ug/L	J	1	5	5	1	P	JWJ	11/22/17 14:48	112217A-1	1713802
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	11/22/17 14:48	112217A-1	1713802

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436463005**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147635**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	84.8	mg/L		0.453	1.24	1.24	1		TXT1	11/24/17 10:52		1721549

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1713802	1713801	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1713852	1713851	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463006**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147650**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:09	111417W1-4	1718336

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463010**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147680**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:14	111417W1-4	1718336

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436463010

BASIS: As Received

DATE COLLECTED 25-OCT-17

CLIENT ID: CAMO-18-147680

LEVEL: Low

DATE RECEIVED 27-OCT-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-38-2	Arsenic	2.59	ug/L	J	2	5	5	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-39-3	Barium	8.33	ug/L		1	5	5	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-42-8	Boron	24.7	ug/L	J	15	50	50	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-70-2	Calcium	24500	ug/L		50	200	200	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-47-3	Chromium	3	ug/L	U	3	10	10	1	MS	BAJ	10/29/17 13:46	171029-3	1713852
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7439-95-4	Magnesium	5580	ug/L		110	300	300	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7439-98-7	Molybdenum	2.64	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-02-0	Nickel	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/29/17 13:46	171029-3	1713852
7440-09-7	Potassium	1610	ug/L		50	150	150	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7631-86-9	Silica	55600	ug/L		53	213	213	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-23-5	Sodium	14500	ug/L		100	300	300	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-24-6	Strontium	102	ug/L		1	5	5	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-61-1	Uranium	1.42	ug/L		0.067	0.2	0.2	1	MS	BAJ	10/29/17 00:01	171028-2	1713852
7440-62-2	Vanadium	4.4	ug/L	J	1	5	5	1	P	JWJ	11/22/17 14:51	112217A-1	1713802
7440-66-6	Zinc	3.3	ug/L	U	3.3	10	10	1	P	JWJ	11/22/17 14:51	112217A-1	1713802

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436463010**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147680**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	84.1	mg/L		0.453	1.24	1.24	1		TXT1	11/24/17 10:52		1721549

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1713802	1713801	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1713852	1713851	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463011**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAMO-18-147683**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:16	111417W1-4	1718336

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463013**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147555**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:18	111417W1-4	1718336

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 436463013

BASIS: As Received

DATE COLLECTED 25-OCT-17

CLIENT ID: CAPA-18-147555

LEVEL: Low

DATE RECEIVED 27-OCT-17

MATRIX: W

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	68	ug/L	U	68	200	200	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-36-0	Antimony	1	ug/L	U	1	3	3	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-38-2	Arsenic	2.11	ug/L	J	2	5	5	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-39-3	Barium	15.5	ug/L		1	5	5	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-41-7	Beryllium	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-42-8	Boron	15	ug/L	U	15	50	50	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-43-9	Cadmium	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-70-2	Calcium	12600	ug/L		50	200	200	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-47-3	Chromium	3.75	ug/L	J	3	10	10	1	MS	BAJ	10/29/17 13:48	171029-3	1713852
7440-48-4	Cobalt	1	ug/L	U	1	5	5	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-50-8	Copper	3	ug/L	U	3	10	10	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7439-89-6	Iron	30	ug/L	U	30	100	100	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7439-92-1	Lead	0.50	ug/L	U	0.5	2	2	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7439-95-4	Magnesium	3400	ug/L		110	300	300	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7439-96-5	Manganese	2	ug/L	U	2	10	10	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7439-98-7	Molybdenum	1.3	ug/L		0.2	0.5	0.5	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-02-0	Nickel	0.884	ug/L	J	0.6	2	2	1	MS	BAJ	10/29/17 13:48	171029-3	1713852
7440-09-7	Potassium	1330	ug/L		50	150	150	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7782-49-2	Selenium	2	ug/L	U	2	5	5	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7631-86-9	Silica	64700	ug/L		53	213	213	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-22-4	Silver	0.30	ug/L	U	0.3	1	1	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-23-5	Sodium	9940	ug/L		100	300	300	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-24-6	Strontium	54.6	ug/L		1	5	5	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-28-0	Thallium	0.60	ug/L	U	0.6	2	2	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-31-5	Tin	2.5	ug/L	U	2.5	10	10	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-61-1	Uranium	0.190	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	10/29/17 00:04	171028-2	1713852
7440-62-2	Vanadium	4.6	ug/L	J	1	5	5	1	P	JWJ	11/22/17 14:53	112217A-1	1713802
7440-66-6	Zinc	42	ug/L		3.3	10	10	1	P	JWJ	11/22/17 14:53	112217A-1	1713802

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 436463013**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147555**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	45.5	mg/L		0.453	1.24	1.24	1		TXT1	11/24/17 10:52		1721549

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1713802	1713801	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1713852	1713851	SW846 3005A	50	mL	50	mL	10/27/17	JXM8
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

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

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2018-584**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 436463014**BASIS:** As Received**DATE COLLECTED** 25-OCT-17**CLIENT ID:** CAPA-18-147581**LEVEL:** Low**DATE RECEIVED** 27-OCT-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	11/14/17 11:20	111417W1-4	1718336

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1718336	1718327	EPA 245.1/245.2 Prep	20	mL	20	mL	11/13/17	AXS5

***Analytical Methods:**

AV EPA 245.2 1974

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2018-584
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>
1203906919	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Barium	1	ug/L	+/-5	U	P	1	5
	Calcium	50	ug/L	+/-200	U	P	50	200
	Copper	3	ug/L	+/-10	U	P	3	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Potassium	50	ug/L	+/-150	U	P	50	150
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Tin	3.87	ug/L	+/-10	J	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Sodium	100	ug/L	+/-300	U	P	100	300
	Silica	53	ug/L	+/-213	U	P	53	213
	Manganese	2	ug/L	+/-10	U	P	2	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Cobalt	1	ug/L	+/-5	U	P	1	5
1203907097	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
1203918388	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. 2018-584

Client ID: CAPA-18-147550S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436463001

Spike ID: 1203906922

<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	4690		68	U	5000	93.9		P
Barium	ug/L	75-125	481		18.2		500	92.6		P
Beryllium	ug/L	75-125	468		1	U	500	93.5		P
Boron	ug/L	75-125	477		15	U	500	93.2		P
Calcium	ug/L	75-125	20300		15600		5000	94.5		P
Cobalt	ug/L	75-125	471		1	U	500	94.2		P
Copper	ug/L	75-125	471		3	U	500	94.2		P
Iron	ug/L	75-125	4710		30	U	5000	94		P
Magnesium	ug/L	75-125	8660		3810		5000	97		P
Manganese	ug/L	75-125	461		2	U	500	92.2		P
Potassium	ug/L	75-125	6360		1600		5000	95.4		P
Silica	ug/L		67100		57400		10700	90.1	N/A	P
Sodium	ug/L	75-125	14500		10000		5000	89.7		P
Strontium	ug/L	75-125	540		76		500	92.7		P
Tin	ug/L	75-125	459		2.5	U	500	91.8		P
Zinc	ug/L	75-125	447		3.3	U	500	89.4		P
Vanadium	ug/L	75-125	471		5.82		500	93.1		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-584

Client ID: CAPA-18-147550S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436463001

Spike ID: 1203907100

<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	48.9		1	U	50	97.4		MS
Arsenic	ug/L	75-125	51.6		2.16	J	50	98.8		MS
Cadmium	ug/L	75-125	50.6		0.3	U	50	101		MS
Chromium	ug/L	75-125	59.3		4.65	J	50	109		MS
Lead	ug/L	75-125	49.2		0.5	U	50	98.3		MS
Molybdenum	ug/L	75-125	52.7		1.65		50	102		MS
Nickel	ug/L	75-125	52.1		0.6	U	50	103		MS
Selenium	ug/L	75-125	50.8		2	U	50	99.8		MS
Silver	ug/L	75-125	51.1		0.3	U	50	102		MS
Thallium	ug/L	75-125	46		0.6	U	50	92		MS
Uranium	ug/L	75-125	48.1		0.414		50	95.5		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2018-584

Client ID: CAPA-18-147550S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 436463001

Spike ID: 1203918391

<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	101		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-584

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-18-147550D

Matrix: WATER

Level: Low

Sample ID: 436463001

Duplicate ID: 1203906921

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	18.2		18.7		2.34		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	15600		16000		2.22		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%	3810		3860		1.4		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1600		1660		4.09		P
Silica	ug/L	+/-20%	57400		58500		1.82		P
Sodium	ug/L	+/-20%	10000		10200		1.97		P
Strontium	ug/L	+/-20%	76		77.4		1.84		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	5.82		6.09		4.47		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
-6-
Duplicate Sample Summary

SDG No.: 2018-584

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-18-147550D

Matrix: WATER

Level: Low

Sample ID: 436463001

Duplicate ID: 1203907099

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	+/-5	2.16 J		2.22 J		2.83		MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L	+/-10	4.65 J		4.38 J		5.95		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.65		1.52		8.35		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	0.414		0.399		3.69		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
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Duplicate Sample Summary

SDG No.: 2018–584**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAPA–18–147550D**Matrix:** WATER**Level:** Low**Sample ID:** 436463001**Duplicate ID:** 1203918390**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. 2018-584

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>
1203906920								
	Aluminum	ug/L	5000	4860		97.3	80-120	P
	Barium	ug/L	500	475		95.1	80-120	P
	Beryllium	ug/L	500	473		94.6	80-120	P
	Boron	ug/L	500	470		93.9	80-120	P
	Calcium	ug/L	5000	4870		97.5	80-120	P
	Cobalt	ug/L	500	487		97.4	80-120	P
	Copper	ug/L	500	479		95.8	80-120	P
	Iron	ug/L	5000	4830		96.6	80-120	P
	Magnesium	ug/L	5000	4960		99.2	80-120	P
	Manganese	ug/L	500	478		95.6	80-120	P
	Potassium	ug/L	5000	4640		92.8	80-120	P
	Silica	ug/L	10700	9630		90	80-120	P
	Sodium	ug/L	5000	4560		91.3	80-120	P
	Strontium	ug/L	500	476		95.2	80-120	P
	Tin	ug/L	500	475		95.1	80-120	P
	Vanadium	ug/L	500	476		95.1	80-120	P
	Zinc	ug/L	500	458		91.6	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-584

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>
1203907098								
	Antimony	ug/L	50	46.2		92.3	80-120	MS
	Arsenic	ug/L	50	48.3		96.7	80-120	MS
	Cadmium	ug/L	50	50.2		100	80-120	MS
	Chromium	ug/L	50	50.3		101	80-120	MS
	Lead	ug/L	50	47.3		94.7	80-120	MS
	Molybdenum	ug/L	50	48.9		97.7	80-120	MS
	Nickel	ug/L	50	47.8		95.7	80-120	MS
	Selenium	ug/L	50	49.6		99.2	80-120	MS
	Silver	ug/L	50	49.3		98.6	80-120	MS
	Thallium	ug/L	50	44.8		89.6	80-120	MS
	Uranium	ug/L	50	45.1		90.1	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2018-584

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>
1203918389	Mercury	ug/L	2	2.07		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-584

Client ID: CAPA-18-147550L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436463001

Serial Dilution ID: 1203906923

<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	18.2		20.2	J	10.828			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	15600		16800		7.386		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	3810		4140		8.785			P
Manganese	2	U	10	U				P
Potassium	1600		1530		4.073			P
Silica	57400		60900		5.976		10	P
Sodium	10000		10800		7.5		10	P
Strontium	76		80.2		5.543		10	P
Tin	2.5	U	12.5	U				P
Vanadium	5.82		5.37	J	7.796			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-584

Client ID: CAPA-18-147550L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 436463001

Serial Dilution ID: 1203907101

<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	2.16	J	10	U	64.349			MS
Cadmium	.3	U	1.5	U				MS
Chromium	4.65	J	15	U	1.247			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.65		1.42	J	14.086			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	.414		.41	J	.966			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2018-584 **Client ID:** CAPA-18-147550L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 436463001 **Serial Dilution ID:** 1203918392

<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 #: 2018-584
Work Order #: 436463**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1714357

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
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203908472	Method Blank (MB)
1203908473	Laboratory Control Sample (LCS)
1203908474	436322006(CAPA-18-147578) Sample Duplicate (DUP)
1203908476	436322006(CAPA-18-147578) 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 436322006 (CAPA-18-147578) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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:	1713610	Method:	WSP-CN(T)
Prep Batch :	1713609	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
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203906458	Method Blank (MB)
1203906459	Laboratory Control Sample (LCS)
1203906461	436463002(CAPA-18-147576) Sample Duplicate (DUP)
1203906463	436463002(CAPA-18-147576) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436463002 (CAPA-18-147576) 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

Sample 436463002 (CAPA-18-147576) was 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:

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Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1715567 **Method:** WSP-ANIONS

Sample Analysis

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

Sample ID	Client ID
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203911413	Method Blank (MB)
1203911414	Laboratory Control Sample (LCS)
1203911415	436504005(CAPA-18-147570) Sample Duplicate (DUP)
1203911416	436504005(CAPA-18-147570) Post Spike (PS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436504005 (CAPA-18-147570) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Manual Integrations

Samples 1203911415 (CAPA-18-147570DUP), 1203911416 (CAPA-18-147570PS), 436463001 (CAPA-18-147550), 436463005 (CAMO-18-147635), 436463010 (CAMO-18-147680) and 436463013 (CAPA-18-147555) 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: 1714362 **Method:** NH3

Prep Batch : 1714361 **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
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203908495	Method Blank (MB)
1203908496	Laboratory Control Sample (LCS)
1203908497	436027001(CAPA-18-147558) Sample Duplicate (DUP)
1203908498	436027001(CAPA-18-147558) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436027001 (CAPA-18-147558) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Total Kjeldahl Nitrogen		
Analytical Batch:	1714720	Method:	TKN
Prep Batch :	1714719	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
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203909428	Method Blank (MB)
1203909429	Laboratory Control Sample (LCS)
1203909430	435631005(CAPA-18-147589) Sample Duplicate (DUP)
1203909431	435631005(CAPA-18-147589) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 435631005 (CAPA-18-147589) was selected for QC analysis.

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

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

Analyte	Sample	Value
Nitrogen, Total Kjeldahl	1203909431 (CAPA-18-147589MS)	111 * (90%-110%)

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

Sample 1203909429 (LCS) was 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: 1714065

Method: NO3NO2

Sample Analysis

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

Sample ID	Client ID
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203907654	Method Blank (MB)
1203907655	Laboratory Control Sample (LCS)
1203907656	436322001(CAPA-18-147551) Sample Duplicate (DUP)
1203907659	436322001(CAPA-18-147551) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-128 REV# 9.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436322001 (CAPA-18-147551) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following samples 1203907656 (CAPA-18-147551DUP), 1203907659 (CAPA-18-147551PS) and 436463001 (CAPA-18-147550) in this sample group were diluted due to matrix interference. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	436463
	001
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:	1714723	Method:	PO4
Prep Batch :	1714722	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
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203909436	Method Blank (MB)
1203909437	Laboratory Control Sample (LCS)
1203909440	436463001(CAPA-18-147550) Sample Duplicate (DUP)
1203909442	436463001(CAPA-18-147550) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436463001 (CAPA-18-147550) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1714366

Method: TDS

Sample Analysis

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

Sample ID	Client ID
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203908511	Method Blank (MB)
1203908512	Laboratory Control Sample (LCS)
1203910423	436463001(CAPA-18-147550) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 15.

Preparation/Analytical Method Verification

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

Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Consecutive Weight Checks

All consecutive weight checks were met.

Quality Control (QC) Designation

Sample 436463001 (CAPA-18-147550) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Analyte	Sample	Value
Total Dissolved Solids	1203910423 (CAPA-18-147550DUP)	8.77* (0%-5%)

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Specific Conductivity

Analytical Batch: 1714428

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
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203908702	Laboratory Control Sample (LCS)
1203908703	436027001(CAPA-18-147558) 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 recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436027001 (CAPA-18-147558) was selected for QC analysis.

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH
Analytical Batch: 1715386 **Method:** PH

Sample Analysis

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

Sample ID	Client ID
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203910983	Laboratory Control Sample (LCS)
1203910984	436615004(CAPA-18-147567) Sample Duplicate (DUP)
1203911838	435335001(NonSDG) Sample Duplicate (DUP)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Samples 435335001 (NonSDG) and 436615004 (CAPA-18-147567) 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
1203910984 (CAPA-18-147567DUP)	pH	Received 31-OCT-17, out of holding 27-OCT-17
1203911838 (Non SDG 435335001DUP)	pH	Received 17-OCT-17, out of holding 05-OCT-17
436463001 (CAPA-18-147550)	pH	Received 27-OCT-17, out of holding 25-OCT-17
436463005 (CAMO-18-147635)	pH	Received 27-OCT-17, out of holding 25-OCT-17
436463010 (CAMO-18-147680)	pH	Received 27-OCT-17, out of holding 25-OCT-17
436463013 (CAPA-18-147555)	pH	Received 27-OCT-17, out of holding 25-OCT-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:

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Method/Analysis Information

Product: Alkalinity
Analytical Batch: 1715371 **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
436463001	CAPA-18-147550
436463005	CAMO-18-147635
436463010	CAMO-18-147680
436463013	CAPA-18-147555
1203910950	Laboratory Control Sample (LCS)
1203910953	436615004(CAPA-18-147567) Sample Duplicate (DUP)
1203910955	436615004(CAPA-18-147567) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Laboratory Control Sample Duplicate (LCSD)

An LCSD was not used in place of matrix QC.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

Sample 436615004 (CAPA-18-147567) was selected for QC analysis.

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information**Additional Comments**

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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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: 2018-584 GEL Work Order: 436463


The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Aubrey Kingsbury

Date: 16 NOV 2017

Title: Analyst I

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 22, 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: 2018-584

Client Sample ID: CAPA-18-147550
Sample ID: 436463001
Matrix: W
Collect Date: 25-OCT-17 09:44
Receive Date: 27-OCT-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	11/02/17	2032	1715567	1
Chloride		3.87	0.067	0.200	mg/L		1					
Fluoride		0.291	0.033	0.100	mg/L		1					
Sulfate		5.74	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0503	0.017	0.050	mg/L	1.00	1	KLP1	11/01/17	1354	1714362	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		1.12	0.170	0.500	mg/L		10	KLP1	10/30/17	1153	1714065	3
PO4 "As Received"												
Phosphorus, Total as P	U	ND	0.020	0.050	mg/L	1.00	1	KLP1	11/02/17	1253	1714723	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		156	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		70.7	1.45	4.00	mg/L			RXB5	11/07/17	1250	1715371	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		200	1.00	1.00	umhos/cm		1	VH1	11/08/17	1031	1714428	7
PH "As Received"												
pH at Temp 17.9C	H	8.09	0.010	0.100	SU		1	RXB5	11/07/17	1248	1715386	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	11/01/17	0940	1714361
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/01/17	1600	1714722

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 22, 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: 2018-584

Client Sample ID: CAPA-18-147550
Sample ID: 436463001

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-584

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147576

Project: ESHL00114

Sample ID: 436463002

Client ID: ARSL004

Matrix: W

Collect Date: 25-OCT-17 09:44

Receive Date: 27-OCT-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	0.464	0.330	1.00	mg/L		1	TSM	11/05/17	0923	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1031	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/02/17	0927	1714720	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/01/17	1600	1714719

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

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 22, 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: 2018-584

Client Sample ID: CAMO-18-147635
Sample ID: 436463005
Matrix: W
Collect Date: 25-OCT-17 13:50
Receive Date: 27-OCT-17
Collector: Client

Project: ESHL00114
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0679	0.067	0.200	mg/L		1	MXL2	11/02/17	2101	1715567	1
Chloride		4.96	0.067	0.200	mg/L		1					
Fluoride		0.513	0.033	0.100	mg/L		1					
Sulfate		9.65	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.090	0.017	0.050	mg/L	1.00	1	KLP1	11/01/17	1355	1714362	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.400	0.017	0.050	mg/L		1	KLP1	10/30/17	1158	1714065	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0297	0.020	0.050	mg/L	1.00	1	KLP1	11/02/17	1256	1714723	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		189	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		103	1.45	4.00	mg/L			RXB5	11/07/17	1252	1715371	6
Carbonate alkalinity (CaCO3)	J	1.60	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		281	1.00	1.00	umhos/cm		1	VH1	11/08/17	1031	1714428	7
PH "As Received"												
pH at Temp 16.7C	H	8.36	0.010	0.100	SU		1	RXB5	11/07/17	1250	1715386	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	11/01/17	0940	1714361
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/01/17	1600	1714722

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: November 22, 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: 2018-584

Client Sample ID: CAMO-18-147635
Sample ID: 436463005

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

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Certificate of Analysis

Report Date: November 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-584

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-147650

Project: ESHL00114

Sample ID: 436463006

Client ID: ARSL004

Matrix: W

Collect Date: 25-OCT-17 13:50

Receive Date: 27-OCT-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	0.467	0.330	1.00	mg/L		1	TSM	11/05/17	1010	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1018	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/02/17	0928	1714720	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/01/17	1600	1714719

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: November 22, 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: 2018-584

Client Sample ID: CAMO-18-147680
Sample ID: 436463010
Matrix: W
Collect Date: 25-OCT-17 13:50
Receive Date: 27-OCT-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	11/02/17	2130	1715567	1
Chloride		4.95	0.067	0.200	mg/L		1					
Fluoride		0.481	0.033	0.100	mg/L		1					
Sulfate		9.72	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	11/01/17	1356	1714362	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.404	0.017	0.050	mg/L		1	KLP1	10/30/17	1200	1714065	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0323	0.020	0.050	mg/L	1.00	1	KLP1	11/02/17	1256	1714723	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		177	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		104	1.45	4.00	mg/L			RXB5	11/07/17	1257	1715371	6
Carbonate alkalinity (CaCO3)	J	2.79	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		280	1.00	1.00	umhos/cm		1	VH1	11/08/17	1032	1714428	7
PH "As Received"												
pH at Temp 16.7C	H	8.39	0.010	0.100	SU		1	RXB5	11/07/17	1256	1715386	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	11/01/17	0940	1714361
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/01/17	1600	1714722

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Certificate of Analysis

Report Date: November 22, 2017

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Address : TA-00, SM1237, Rm104C

Los Alamos, New Mexico 87545
Contact: Ms. Nita Patel
Project: LANL- WQH Water Samples

Client SDG: 2018-584

Client Sample ID: CAMO-18-147680
Sample ID: 436463010

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

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Certificate of Analysis

Report Date: November 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-584

Project: LANL- WQH Water Samples

Client Sample ID: CAMO-18-147683

Project: ESHL00114

Sample ID: 436463011

Client ID: ARSL004

Matrix: W

Collect Date: 25-OCT-17 13:50

Receive Date: 27-OCT-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	0.384	0.330	1.00	mg/L		1	TSM	11/05/17	1057	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1019	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/02/17	0929	1714720	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/01/17	1600	1714719

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: November 22, 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: 2018-584

Client Sample ID: CAPA-18-147555
Sample ID: 436463013
Matrix: W
Collect Date: 25-OCT-17 11:51
Receive Date: 27-OCT-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	11/02/17	2200	1715567	1
Chloride		2.16	0.067	0.200	mg/L		1					
Fluoride		0.209	0.033	0.100	mg/L		1					
Sulfate		2.80	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0608	0.017	0.050	mg/L	1.00	1	KLP1	11/01/17	1357	1714362	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.636	0.017	0.050	mg/L		1	KLP1	10/30/17	1201	1714065	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0323	0.020	0.050	mg/L	1.00	1	KLP1	11/02/17	1257	1714723	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		133	3.40	14.3	mg/L			KLP1	10/31/17	1343	1714366	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		62.7	1.45	4.00	mg/L			RXB5	11/07/17	1301	1715371	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		290	1.00	1.00	umhos/cm		1	VH1	11/08/17	1032	1714428	7
PH "As Received"												
pH at Temp 17.5C	H	7.29	0.010	0.100	SU		1	RXB5	11/07/17	1259	1715386	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	11/01/17	0940	1714361
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	11/01/17	1600	1714722

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Certificate of Analysis

Report Date: November 22, 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: 2018-584

Client Sample ID: CAPA-18-147555
Sample ID: 436463013

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	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: November 22, 2017

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

Los Alamos, New Mexico 87545

Contact: Ms. Nita Patel

Client SDG: 2018-584

Project: LANL- WQH Water Samples

Client Sample ID: CAPA-18-147581

Project: ESHL00114

Sample ID: 436463014

Client ID: ARSL004

Matrix: W

Collect Date: 25-OCT-17 11:51

Receive Date: 27-OCT-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	0.482	0.330	1.00	mg/L		1	TSM	11/05/17	1207	1714357	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	10/30/17	1020	1713610	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1.00	1	KLP1	11/02/17	1049	1714720	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	10/30/17	0847	1713609
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	11/01/17	1600	1714719

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

Quality Control Summary

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QC Summary

Report Date: November 16, 2017

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

Contact: Ms. Nita Patel

Workorder: 436463

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1714357										
QC1203908474	436322006	DUP									
Total Organic Carbon Average		J	0.524	J	0.395	mg/L	28.1	^	(+/-1.00)	TSM	11/05/17 04:41
QC1203908473	LCS										
Total Organic Carbon Average	10.0				10.2	mg/L			102	(80%-120%)	11/05/17 01:46
QC1203908472	MB										
Total Organic Carbon Average			U		ND	mg/L					11/05/17 01:34
QC1203908476	436322006	PS									
Total Organic Carbon Average	10.0	J	0.524		11.3	mg/L			107	(75%-125%)	11/05/17 05:28
Flow Injection Analysis											
Batch	1713610										
QC1203906461	436463002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			AXH3	10/30/17 10:15
QC1203906459	LCS										
Cyanide, Total	50.0				48.6	ug/L			97.2	(90%-110%)	10/30/17 09:51
QC1203906458	MB										
Cyanide, Total			U		ND	ug/L					10/30/17 09:50
QC1203906463	436463002	MS									
Cyanide, Total	100	U	ND		107	ug/L			107	(90%-110%)	10/30/17 10:16
Ion Chromatography											
Batch	1715567										
QC1203911415	436504005	DUP									
Bromide		U	ND	U	ND	mg/L	N/A			MXL2	11/03/17 00:57

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QC Summary

Workorder: 436463

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1715567										
Chloride		2.41		2.36	mg/L	2		(0%-20%)	MXL2	11/03/17	00:57
Fluoride		0.239		0.243	mg/L	1.53	^	(+/-0.100)			
Sulfate		3.22		3.18	mg/L	1.26		(0%-20%)			
QC1203911414 LCS											
Bromide	1.25			1.16	mg/L		92.5	(80%-120%)		11/02/17	18:34
Chloride	5.00			4.62	mg/L		92.5	(80%-120%)			
Fluoride	2.50			2.48	mg/L		99.1	(80%-120%)			
Sulfate	10.0			9.46	mg/L		94.6	(80%-120%)			
QC1203911413 MB											
Bromide			U	ND	mg/L					11/02/17	18:04
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1203911416 436504005 PS											
Bromide	1.25	U	ND	1.24	mg/L		95.7	(75%-125%)		11/03/17	01:26
Chloride	5.00		2.41	7.29	mg/L		97.6	(75%-125%)			
Fluoride	2.50		0.239	2.74	mg/L		100	(75%-125%)			
Sulfate	10.0		3.22	12.8	mg/L		95.5	(75%-125%)			

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QC Summary

Workorder: 436463

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1714065										
QC1203907656	436322001	DUP									
Nitrogen, Nitrate/Nitrite		0.945		0.885	mg/L	6.56	^	(+/-0.250)	KLP1	10/30/17	11:30
QC1203907655	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.07	mg/L			107 (90%-110%)		10/30/17	11:26
QC1203907654	MB										
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					10/30/17	11:25
QC1203907659	436322001	PS									
Nitrogen, Nitrate/Nitrite	1.00	0.189		1.28	mg/L			109 (90%-110%)		10/30/17	11:31
Batch	1714362										
QC1203908497	436027001	DUP									
Nitrogen, Ammonia		0.138		0.142	mg/L	2.86	^	(+/-0.050)	KLP1	11/01/17	13:35
QC1203908496	LCS										
Nitrogen, Ammonia	1.00			0.935	mg/L			93.5 (90%-110%)		11/01/17	13:30
QC1203908495	MB										
Nitrogen, Ammonia			U	ND	mg/L					11/01/17	13:29
QC1203908498	436027001	MS									
Nitrogen, Ammonia	1.00	0.138		1.15	mg/L			101 (90%-110%)		11/01/17	13:35
Batch	1714720										
QC1203909430	435631005	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A		KLP1	11/02/17	09:04
QC1203909429	LCS										
Nitrogen, Total Kjeldahl	1.00			0.967	mg/L			96.7 (90%-110%)		11/02/17	09:51
QC1203909428	MB										
Nitrogen, Total Kjeldahl			U	ND	mg/L					11/02/17	09:00

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QC Summary

Workorder: 436463

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1714720										
QC1203909431	435631005	MS									
Nitrogen, Total Kjeldahl	1.00	U	ND	1.11	mg/L		111 *	(90%-110%)	KLP1	11/02/17	09:05
Batch	1714723										
QC1203909440	436463001	DUP									
Phosphorus, Total as P		U	ND	ND	mg/L	N/A			KLP1	11/02/17	12:54
QC1203909437	LCS										
Phosphorus, Total as P	1.00			1.06	mg/L		106	(80%-124%)		11/02/17	12:51
QC1203909436	MB										
Phosphorus, Total as P			J	0.0207	mg/L					11/02/17	12:51
QC1203909442	436463001	MS									
Phosphorus, Total as P	1.00	U	ND	1.07	mg/L		105	(63%-139%)		11/02/17	12:55
Solids Analysis											
Batch	1714366										
QC1203910423	436463001	DUP									
Total Dissolved Solids			156	170	mg/L	8.77 *		(0%-5%)	KLP1	10/31/17	13:43
QC1203908512	LCS										
Total Dissolved Solids	300			289	mg/L		96.2	(95%-105%)		10/31/17	13:43
QC1203908511	MB										
Total Dissolved Solids			U	ND	mg/L					10/31/17	13:43
Titration and Ion Analysis											
Batch	1714428										
QC1203908703	436027001	DUP									
Conductivity			307	306	umhos/cm	0.326		(0%-10%)	VH1	11/08/17	10:29
QC1203908702	LCS										
Conductivity	1410			1400	umhos/cm		98.7	(95%-105%)		11/08/17	10:27

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QC Summary

Workorder: 436463

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1715371										
QC1203910953	436615004	DUP									
Alkalinity, Total as CaCO3		59.9		61.3	mg/L	2.31		(0%-20%)	RXB5	11/07/17	14:40
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1203910950	LCS										
Alkalinity, Total as CaCO3	100			107	mg/L		107	(90%-110%)		11/07/17	12:44
QC1203910955	436615004	MS									
Alkalinity, Total as CaCO3	100	59.9		162	mg/L		102	(80%-120%)		11/07/17	14:41
Batch	1715386										
QC1203910984	436615004	DUP									
pH	H	8.12	H	8.13	SU	0.123		(0%-5%)	RXB5	11/07/17	14:37
QC1203911838	435335001	DUP									
pH	H	7.63	H	7.62	SU	0.131		(0%-5%)		11/07/17	13:38
QC1203910983	LCS										
pH	7.00			7.00	SU		100	(99%-101%)		11/07/17	12:44

Notes:

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

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Workorder: 436463[illegible]

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 #: 2018-584
Work Order #: 436463**

Method/Analysis Information

Product: Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1715443

Sample ID	Client ID
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203911096	Method Blank (MB)
1203911098	Laboratory Control Sample (LCS)
1203911097	436463002(CAPA-18-147576) 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-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in October 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203911096 (MB) and 1203911098 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 436463002 (CAPA-18-147576). The QC was from ARSL work order 436463.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

Sample (See Below) did not meet the detection limit due to the high standard deviation. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The sample was counted the maximum count time of in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
436463006 (CAMO-18-147650)	Americium-241	Result -0.00827 < MDA 0.0725 > RDL 0.05 pCi/L

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: ISOPU
Analytical Method: HASL-300:ISOPU
Analytical Batch Number: 1715444

Sample ID	Client ID
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203911099	Method Blank (MB)
1203911101	Laboratory Control Sample (LCS)
1203911100	436463002(CAPA-18-147576) 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-RAD-A-011 REV# 26.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibrations were performed in November 2017 and October 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

Aliquots for samples 1203911099 (MB) and 1203911101 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 436463002 (CAPA-18-147576). The QC was from ARSL work order 436463.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

Samples (See Below) did not meet the detection limits due to the high standard deviation. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of in order to achieve the lowest possible MDAs.

Sample	Analyte	Value
1203911100 (CAPA-18-147576DUP)	Plutonium-239/240	Result 0.0273 < MDA 0.0576 > RDL 0.05 pCi/L
436463002 (CAPA-18-147576)	Plutonium-238	Result 0.0041 < MDA 0.0604 > RDL 0.05 pCi/L
	Plutonium-239/240	Result 0 < MDA 0.0863 > RDL 0.05 pCi/L
436463006 (CAMO-18-147650)	Plutonium-239/240	Result -0.00735 < MDA 0.0775 > RDL 0.05 pCi/L
436463011 (CAMO-18-147683)	Plutonium-238	Result 0.00387 < MDA 0.0571 > RDL 0.05 pCi/L
	Plutonium-239/240	Result -0.0194 < MDA 0.0816 > RDL 0.05 pCi/L
436463014 (CAPA-18-147581)	Plutonium-239/240	Result -0.00348 < MDA 0.0733 > RDL 0.05 pCi/L

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required prep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: IsoU

Analytical Method: HASL-300:ISOU

Analytical Batch Number: 1715445

Sample ID	Client ID
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203911103	Method Blank (MB)
1203911105	Laboratory Control Sample (LCS)
1203911104	436463002(CAPA-18-147576) 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-RAD-A-011 REV# 26.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244. The initial Calibration was performed in November 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

Aliquots for samples 1203911103 (MB) and 1203911105 (LCS) were changed to 1.0, and the MDCs (and Lc if requested) for all samples are calculated using a blank population per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 436463002 (CAPA-18-147576). The QC was from ARSL work order 436463.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Manual Integration**

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: Gammaspec

Analytical Method: EPA:901.1

Analytical Batch Number: 1716271

Sample ID	Client ID
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203913158	Method Blank (MB)
1203913160	Laboratory Control Sample (LCS)
1203913159	436463002(CAPA-18-147576) 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-RAD-A-013 REV# 27.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2017, July 2017, March 2017, October 2017 and September 2017.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 436463002 (CAPA-18-147576). The QC was from ARSL work order 436463.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Results are considered a false positive due to high peak-width.	Potassium-40	436463006	CAMO-18-147650
			436463014	CAPA-18-147581

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1714184

Sample ID	Client ID
436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203907994	Method Blank (MB)
1203907997	Laboratory Control Sample (LCS)
1203907995	436149002(CAPA-18-147574) Sample Duplicate (DUP)
1203907996	436149002(CAPA-18-147574) 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-RAD-A-004 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2016.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203907994 (MB) and 1203907997 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank result is less than 1.65 times the CSU.

Blank Decision Level

The blank result is less than the decision level.

Tracer/Carrier Yield

All yields met the required acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 436149002 (CAPA-18-147574). The QC was from ARSL work order 436149.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 1203907997 (LCS) was recounted due to high recovery. The recount is reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike, 1203907996 (CAPA-18-147574MS), aliquot was reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	WSP-GrossA/B
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1716449

Sample ID	Client ID
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436463002	CAPA-18-147576
436463006	CAMO-18-147650
436463011	CAMO-18-147683
436463014	CAPA-18-147581
1203913664	Method Blank (MB)
1203913668	Laboratory Control Sample (LCS)
1203913665	437078009(CAPA-18-147631) Sample Duplicate (DUP)
1203913666	437078009(CAPA-18-147631) Matrix Spike (MS)
1203913667	437078009(CAPA-18-147631) Matrix Spike Duplicate (MSD)

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-RAD-A-001 REV# 19.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in December 2016.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

Aliquots for samples 1203913664 (MB) and 1203913668 (LCS) were changed to 1.0 per client request.

Method Blank Criteria

The Method Blank (MB) met acceptance criteria.

CSU

The blank (See Below) result is greater than 1.65 times the CSU but less than the MDC.

Sample	Analyte	Value
1203913664 (MB)	ALPHA and BETA	Blank result > 1.65 CSU

Blank Decision Level

The blank (See Below) result is greater than the decision level but less than the MDC.

Sample	Analyte	Value
1203913664 (MB)	ALPHA and BETA	Blank result > DL

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Designated QC

The following sample was used for QC: 437078009 (CAPA-18-147631). The QC was from ARSL work order 437078.

Matrix Spike (MS) Recovery

The MS spike recoveries met acceptance limits.

Duplication Criteria between MS and MSD

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) met the duplication acceptance criteria.

Duplication Criteria between QC Sample and Duplicate Sample

The QC Sample and Duplicate Sample (DUP) met the duplication acceptance criteria.

RDL Met

The method RDL has been met.

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Negative > 3 sigma TPU

Samples results are not more negative than three sigma TPU.

Sample Re-prep/Re-analysis

None of the samples in this sample set required prep or reanalysis.

Gross Alpha/Beta Preparation Information

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating, especially to a dull red heat. For this sample set, the prepared planchet was counted for beta activity before being flamed. After flaming, the planchet was counted for alpha activity.

Recounts

Sample 1203913666 (CAPA-18-147631MS) was recounted due to low recovery. The recount is reported.

Miscellaneous Information:**Sample-Specific MDA/MDC**

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike and matrix spike duplicate, 1203913666 (CAPA-18-147631MS) and 1203913667 (CAPA-18-147631MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

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: 2018-584 GEL Work Order: 436463

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- UI Gamma Spectroscopy--Uncertain identification

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: Heather McCarty

Date: 21 NOV 2017

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

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

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: November 22, 2017

Client Sample ID: CAPA-18-147576
Sample ID: 436463002
Matrix: W
Collect Date: 25-OCT-17
Receive Date: 27-OCT-17
Collector: Client

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	0.00533	+/-0.00653	0.0467	0.0198	+/-0.00653	0.050	pCi/L			HAKB	11/16/17	1506	1715443	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0041	+/-0.0071	0.0604	0.0247	+/-0.0071	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
Plutonium-239/240	U	0.00	+/-0.013	0.0863	0.0376	+/-0.013	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.442	+/-0.0414	0.0707	0.0303	+/-0.0477	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
Uranium-235/236	U	0.0536	+/-0.0198	0.0755	0.0314	+/-0.020	1.00	pCi/L							
Uranium-238		0.164	+/-0.0267	0.0685	0.0291	+/-0.0281	0.500	pCi/L							

Rad Gamma Spec Analysis

Gammasespec "As Received"

Cesium-137	U	-0.569	+/-1.26	4.08	1.71	+/-1.27	8.00	pCi/L			BSW1	11/16/17	0905	1716271	4
Cobalt-60	U	-0.55	+/-1.57	6.06	2.52	+/-1.58	8.00	pCi/L							
Neptunium-237	U	-0.691	+/-2.90	10.6	4.87	+/-2.90		pCi/L							
Potassium-40	U	6.14	+/-24.3	54.5	22.1	+/-24.3		pCi/L							
Sodium-22	U	1.59	+/-1.26	5.90	2.45	+/-1.31		pCi/L							

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	-0.249	+/-0.102	0.439	0.196	+/-0.102	0.500	pCi/L			LXB3	11/11/17	1542	1714184	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		5.90	+/-0.963	2.50	1.14	+/-1.08	3.00	pCi/L			AXH4	11/15/17	1140	1716449	6
Alpha		2.61	+/-0.908	2.18	0.727	+/-0.935	3.00	pCi/L			AXH4	11/15/17	1648	1716449	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"	1715443	96.7	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1715444	54.5	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1715445	85	(50%-105%)

GEL LABORATORIES LLC

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

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: CAPA-18-147576

Sample ID: 436463002

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 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"							1714184	94.3	(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

GEL LABORATORIES LLC

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

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-18-147650

Sample ID: 436463006

Matrix: W

Collect Date: 25-OCT-17

Receive Date: 27-OCT-17

Collector: Client

Report Date: November 22, 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	-0.00827	+/-0.0117	0.0725	0.0307	+/-0.0117	0.050	pCi/L			HAKB	11/16/17	1507	1715443	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	-0.00735	+/-0.00735	0.0542	0.0221	+/-0.00736	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
Plutonium-239/240	U	-0.00735	+/-0.0147	0.0775	0.0338	+/-0.0147	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		1.20	+/-0.0741	0.0835	0.0357	+/-0.100	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
Uranium-235/236	U	0.0633	+/-0.0214	0.0891	0.0371	+/-0.0217	1.00	pCi/L							
Uranium-238		0.566	+/-0.0511	0.0808	0.0343	+/-0.0602	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-2.86	+/-1.33	4.17	1.82	+/-1.49	8.00	pCi/L			BSW1	11/16/17	0905	1716271	4
Cobalt-60	U	1.68	+/-0.892	4.49	1.86	+/-0.975	8.00	pCi/L							
Neptunium-237	U	-1.48	+/-1.93	7.00	3.15	+/-1.96		pCi/L							
Potassium-40	UI	52.4	+/-25.5	42.9	17.6	+/-25.6		pCi/L							
Sodium-22	U	-0.0427	+/-1.21	4.75	2.00	+/-1.21		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.188	+/-0.128	0.428	0.185	+/-0.129	0.500	pCi/L			LXB3	11/11/17	1544	1714184	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		4.82	+/-0.977	2.70	1.22	+/-1.06	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
Alpha		4.42	+/-1.13	2.19	0.725	+/-1.20	3.00	pCi/L			AXH4	11/15/17	1648	1716449	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"	1715443	54.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1715444	60	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1715445	76.9	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1714184	85.4	(50%-105%)

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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-18-147650

Sample ID: 436463006

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 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-18-147683

Sample ID: 436463011

Matrix: W

Collect Date: 25-OCT-17

Receive Date: 27-OCT-17

Collector: Client

Report Date: November 22, 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	0.00248	+/-0.00657	0.0435	0.0184	+/-0.00657	0.050	pCi/L			HAKB	11/16/17	1508	1715443	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.00387	+/-0.0116	0.0571	0.0233	+/-0.0116	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
Plutonium-239/240	U	-0.0194	+/-0.0128	0.0816	0.0356	+/-0.0128	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		1.33	+/-0.075	0.0776	0.0332	+/-0.104	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
Uranium-235/236	U	0.046	+/-0.0176	0.0828	0.0345	+/-0.0177	1.00	pCi/L							
Uranium-238		0.505	+/-0.0466	0.0751	0.0319	+/-0.0542	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-0.534	+/-1.14	4.11	1.77	+/-1.15	8.00	pCi/L			BSW1	11/16/17	0906	1716271	4
Cobalt-60	U	0.664	+/-0.887	4.16	1.65	+/-0.900	8.00	pCi/L							
Neptunium-237	U	1.09	+/-2.23	8.55	3.90	+/-2.25		pCi/L							
Potassium-40	U	-7.04	+/-14.7	60.3	25.9	+/-14.8		pCi/L							
Sodium-22	U	0.843	+/-0.785	3.93	1.55	+/-0.810		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	0.309	+/-0.142	0.450	0.195	+/-0.144	0.500	pCi/L			LXB3	11/11/17	1544	1714184	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		4.67	+/-0.969	2.72	1.24	+/-1.04	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
Alpha		3.51	+/-0.986	2.14	0.744	+/-1.03	3.00	pCi/L			AXH4	11/15/17	1649	1716449	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"	1715443	91.9	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1715444	56.8	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1715445	81.3	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1714184	65	(50%-105%)

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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-18-147683

Sample ID: 436463011

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 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: CAPA-18-147581

Sample ID: 436463014

Matrix: W

Collect Date: 25-OCT-17

Receive Date: 27-OCT-17

Collector: Client

Report Date: November 22, 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	0.0145	+/-0.00762	0.0422	0.0179	+/-0.00765	0.050	pCi/L			HAKB	11/16/17	1513	1715443	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0104	+/-0.00921	0.0513	0.0209	+/-0.00923	0.050	pCi/L			HAKB	11/19/17	1059	1715444	2
Plutonium-239/240	U	-0.00348	+/-0.00778	0.0733	0.0319	+/-0.00778	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		0.263	+/-0.034	0.0726	0.031	+/-0.0368	1.00	pCi/L			HAKB	11/16/17	0731	1715445	3
Uranium-235/236	U	0.031	+/-0.0163	0.0775	0.0322	+/-0.0164	1.00	pCi/L							
Uranium-238		0.120	+/-0.0225	0.0702	0.0299	+/-0.0234	0.500	pCi/L							
Rad Gamma Spec Analysis															
<i>Gammasespec "As Received"</i>															
Cesium-137	U	-0.493	+/-1.16	4.11	1.79	+/-1.17	8.00	pCi/L			BSW1	11/16/17	0906	1716271	4
Cobalt-60	U	0.602	+/-1.04	4.38	1.79	+/-1.05	8.00	pCi/L							
Neptunium-237	U	2.75	+/-2.33	9.07	4.18	+/-2.42		pCi/L							
Potassium-40	UI	39.5	+/-21.3	32.4	12.2	+/-21.4		pCi/L							
Sodium-22	U	0.375	+/-1.28	5.12	2.17	+/-1.29		pCi/L							
Rad Gas Flow Proportional Counting															
<i>GFPC, Sr90, liquid "As Received"</i>															
Strontium-90	U	-0.08	+/-0.108	0.435	0.189	+/-0.108	0.500	pCi/L			LXB3	11/11/17	1544	1714184	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		3.38	+/-0.891	2.63	1.20	+/-0.936	3.00	pCi/L			AXH4	11/15/17	1141	1716449	6
Alpha	U	-0.0317	+/-0.557	2.31	0.923	+/-0.557	3.00	pCi/L			AXH4	11/15/17	1649	1716449	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"	1715443	92.5	(50%-105%)
Plutonium-242 Tracer		ISOPU "As Received"	1715444	72.2	(50%-105%)
Uranium-232 Tracer		IsoU "As Received"	1715445	85.2	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1714184	86.6	(50%-105%)

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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: CAPA-18-147581

Sample ID: 436463014

Project: ESHL00114

Client ID: ARSL004

Report Date: November 22, 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: November 21, 2017

Page 1 of 6

Client : Los Alamos National Laboratory
TA-00, SM1237, Rm104C

Los Alamos, New Mexico

Contact: Ms. Nita Patel

Workorder: 436463

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715443										
QC1203911097	436463002	DUP									
Americium-241	U	0.00533	U	0.0101	pCi/L	0.164		(0-1)	HAKB	11/16/17	16:22
	Uncert:	+/-0.00653		+/-0.00798							
	TPU:	+/-0.00653		+/-0.00799							
**Americium-243 Tracer	5.24	2.53		5.26	pCi/L		100	(50%-105%)			
	Uncert:	+/-0.0833		+/-0.115							
	TPU:	+/-0.147		+/-0.240							
QC1203911098	LCS										
Americium-241	1.97			1.94	pCi/L		98.4	(80%-120%)	HAKB	11/16/17	16:23
	Uncert:			+/-0.0635							
	TPU:			+/-0.110							
**Americium-243 Tracer	2.10			1.81	pCi/L		86.2	(50%-105%)			
	Uncert:			+/-0.0658							
	TPU:			+/-0.117							
QC1203911096	MB										
Americium-241			U	0.00	pCi/L				HAKB	11/16/17	16:22
	Uncert:			+/-0.0054							
	TPU:			+/-0.0054							
**Americium-243 Tracer	2.10			1.99	pCi/L		94.8	(50%-105%)			
	Uncert:			+/-0.0631							
	TPU:			+/-0.114							
Batch	1715444										
QC1203911100	436463002	DUP									
Plutonium-238	U	0.0041	U	0.0109	pCi/L	0.23		(0-1)	HAKB	11/19/17	10:59
	Uncert:	+/-0.0071		+/-0.00773							
	TPU:	+/-0.0071		+/-0.00775							
Plutonium-239/240	U	0.00	U	0.0273	pCi/L	0.587		(0-1)			
	Uncert:	+/-0.013		+/-0.0102							
	TPU:	+/-0.013		+/-0.0103							
**Plutonium-242 Tracer	2.47	1.34		1.94	pCi/L		78.7	(50%-105%)			
	Uncert:	+/-0.101		+/-0.0826							
	TPU:	+/-0.179		+/-0.160							
QC1203911101	LCS										
Plutonium-238			U	0.0216	pCi/L			(80%-120%)	HAKB	11/19/17	10:59
	Uncert:			+/-0.00864							
	TPU:			+/-0.00872							
Plutonium-239/240	1.98			2.03	pCi/L		103	(80%-120%)			
	Uncert:			+/-0.0663							
	TPU:			+/-0.130							
**Plutonium-242 Tracer	1.97			1.57	pCi/L		79.4	(50%-105%)			
	Uncert:			+/-0.0657							
	TPU:			+/-0.127							

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QC Summary

Workorder: 436463

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715444										
QC1203911099	MB										
Plutonium-238			U	0.007	pCi/L				HAKB	11/19/17	10:59
				Uncert:							
				TPU:							
Plutonium-239/240			U	0.00933	pCi/L						
				Uncert:							
				TPU:							
**Plutonium-242 Tracer	1.97			1.49	pCi/L		75.3	(50%-105%)			
				Uncert:							
				TPU:							
Batch	1715445										
QC1203911104	436463002	DUP									
Uranium-234		0.442		0.292	pCi/L	0.857		(0-1)	HAKB	11/16/17	07:31
		Uncert:		+/-0.0367							
		TPU:		+/-0.0401							
Uranium-235/236		U	0.0536	U	0.0152	pCi/L	0.594	(0-1)			
		Uncert:		+/-0.0122							
		TPU:		+/-0.0122							
Uranium-238		0.164		0.168	pCi/L	0.035		(0-1)			
		Uncert:		+/-0.029							
		TPU:		+/-0.0304							
**Uranium-232 Tracer	2.62	2.23		2.27	pCi/L		86.5	(50%-105%)			
		Uncert:		+/-0.106							
		TPU:		+/-0.173							
QC1203911105	LCS										
Uranium-234				2.48	pCi/L				HAKB	11/16/17	07:31
		Uncert:		+/-0.0861							
		TPU:		+/-0.158							
Uranium-235/236				0.141	pCi/L						
		Uncert:		+/-0.0233							
		TPU:		+/-0.0245							
Uranium-238	2.70			2.71	pCi/L		100	(80%-120%)			
		Uncert:		+/-0.0902							
		TPU:		+/-0.171							
**Uranium-232 Tracer	2.09			2.12	pCi/L		101	(50%-105%)			
		Uncert:		+/-0.0802							
		TPU:		+/-0.138							
QC1203911103	MB										
Uranium-234			U	0.00781	pCi/L				HAKB	11/16/17	07:31
		Uncert:		+/-0.0118							
		TPU:		+/-0.0118							
Uranium-235/236			U	0.0138	pCi/L						
		Uncert:		+/-0.0105							
		TPU:		+/-0.0105							
Uranium-238			U	0.00476	pCi/L						
		Uncert:		+/-0.00718							
		TPU:		+/-0.00719							

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QC Summary

Workorder: 436463

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1715445										
**Uranium-232 Tracer	2.09			1.93	pCi/L		92.2	(50%-105%)			
	Uncert:			+/-0.0835							
	TPU:			+/-0.141							
Rad Gamma Spec											
Batch	1716271										
QC1203913159	436463002	DUP									
Cesium-137	U	-0.569	U	-0.885	pCi/L	0.0607		(0-1)	BSW1	11/16/17	11:06
	Uncert:	+/-1.26		+/-1.32							
	TPU:	+/-1.27		+/-1.33							
Cobalt-60	U	-0.55	U	0.470	pCi/L	0.179		(0-1)			
	Uncert:	+/-1.57		+/-1.27							
	TPU:	+/-1.58		+/-1.27							
Neptunium-237	U	-0.691	U	6.70	pCi/L	0.536		(0-1)			
	Uncert:	+/-2.90		+/-3.98							
	TPU:	+/-2.90		+/-3.99							
Potassium-40	U	6.14	U	-10.4	pCi/L	0.183		(0-1)			
	Uncert:	+/-24.3		+/-20.7							
	TPU:	+/-24.3		+/-20.9							
Sodium-22	U	1.59	U	0.0529	pCi/L	0.299		(0-1)			
	Uncert:	+/-1.26		+/-1.26							
	TPU:	+/-1.31		+/-1.26							
QC1203913160	LCS										
Americium-241	34300			34900	pCi/L		102	(80%-120%)	BSW1	11/16/17	09:58
	Uncert:			+/-878							
	TPU:			+/-3420							
Cesium-137	13000			13700	pCi/L		105	(80%-120%)			
	Uncert:			+/-180							
	TPU:			+/-915							
Cobalt-60	11300			11100	pCi/L		98.4	(80%-120%)			
	Uncert:			+/-173							
	TPU:			+/-497							
Neptunium-237			U	43.2	pCi/L						
	Uncert:			+/-60.5							
	TPU:			+/-61.4							
Potassium-40			U	36.1	pCi/L						
	Uncert:			+/-96.2							
	TPU:			+/-96.6							
Sodium-22			U	-22.8	pCi/L						
	Uncert:			+/-19.0							
	TPU:			+/-19.7							
QC1203913158	MB										
Cesium-137			U	0.201	pCi/L				BSW1	11/16/17	09:57
	Uncert:			+/-1.21							
	TPU:			+/-1.21							
Cobalt-60			U	0.757	pCi/L						
	Uncert:			+/-1.26							

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QC Summary

Workorder: 436463

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1716271										
Neptunium-237	TPU:			+/-1.27							
			U	-0.0134	pCi/L						
	Uncert:			+/-1.88							
Potassium-40	TPU:			+/-1.88							
			U	15.3	pCi/L						
	Uncert:			+/-12.7							
Sodium-22	TPU:			+/-13.2							
			U	0.346	pCi/L						
	Uncert:			+/-1.15							
	TPU:			+/-1.16							
Rad Gas Flow											
Batch	1714184										
QC1203907995	436149002	DUP									
Strontium-90	U	-0.105	U	0.0561	pCi/L	0.355		(0-1)	LXB3	11/11/17	15:43
	Uncert:	+/-0.104		+/-0.123							
	TPU:	+/-0.104		+/-0.123							
**Strontium Carrier	7.85	6.80		7.80	mg		99.4	(50%-105%)			
QC1203907997	LCS										
Strontium-90	23.7			26.9	pCi/L		113	(80%-120%)	LXB3	11/13/17	08:20
	Uncert:			+/-0.700							
	TPU:			+/-2.41							
**Strontium Carrier	7.85			4.80	mg		61.1	(50%-105%)			
QC1203907994	MB										
Strontium-90			U	-0.0173	pCi/L				LXB3	11/11/17	15:43
	Uncert:			+/-0.0672							
	TPU:			+/-0.0672							
**Strontium Carrier	7.85			6.70	mg		85.4	(50%-105%)			
QC1203907996	436149002	MS									
Strontium-90	237	U	-0.105	181	pCi/L		76.3	(75%-125%)	LXB3	11/11/17	15:43
	Uncert:		+/-0.104	+/-4.90							
	TPU:		+/-0.104	+/-15.4							
**Strontium Carrier	7.85	6.80		8.10	mg		103	(50%-105%)			
Batch	1716449										
QC1203913665	437078009	DUP									
Alpha		2.35	U	1.11	pCi/L	0.36		(0-1)	AXH4	11/15/17	16:48
	Uncert:	+/-0.879		+/-0.802							
	TPU:	+/-0.901		+/-0.808							
Beta	U	2.54		4.00	pCi/L	0.363		(0-1)		11/15/17	11:42
	Uncert:	+/-0.959		+/-0.980							
	TPU:	+/-0.982		+/-1.04							
QC1203913668	LCS										
Alpha	12.1			11.6	pCi/L		95.6	(80%-120%)	AXH4	11/15/17	16:50
	Uncert:			+/-0.557							
	TPU:			+/-1.12							
Beta	47.4			49.7	pCi/L		105	(80%-120%)		11/15/17	12:09

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QC Summary

Workorder: 436463

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time	
Rad Gas Flow												
Batch	1716449											
				Uncert:								
				TPU:								
QC1203913664	MB											
Alpha			U	0.235	pCi/L				AXH4	11/15/17	16:48	
				Uncert:								
				TPU:								
Beta			U	0.276	pCi/L					11/15/17	12:08	
				Uncert:								
				TPU:								
QC1203913666	437078009	MS										
Alpha		483	2.35	371	pCi/L		76.3	(75%-125%)	AXH4	11/16/17	10:18	
			Uncert:	+/-0.879								
			TPU:	+/-0.901								
Beta		1900	U	2.54	2020	pCi/L	107	(75%-125%)		11/15/17	12:08	
			Uncert:	+/-0.959								
			TPU:	+/-0.982								
QC1203913667	437078009	MSD										
Alpha		483	2.35	453	pCi/L	0.494	93.3	(0-1)	AXH4	11/15/17	16:50	
			Uncert:	+/-0.879								
			TPU:	+/-0.901								
Beta		1900	U	2.54	1790	pCi/L	0.364	94.2	(0-1)		11/15/17	12:08
			Uncert:	+/-0.959								
			TPU:	+/-0.982								

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.

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QC Summary

Workorder: 436463

Page 6 of 6

Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
R	Sample results are rejected									
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.



December 08, 2017

gel.com

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

Re: LANL- WQH Water Samples
Work Order: 439255
SDG: 2018-584-1

Dear Ms. Patel:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on October 27, 2017, and analyzed for GC/MS Semivolatile. 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,

B Luthman
Brielle Luthman for
Valerie Davis
Project Manager

Chain of Custody: 2018-584
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Work Order #: 439255
SDG: 2018-584-1

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL- WQH Water Samples
Workorder #: 439255
SDG # : 2018-584-1**

December 08, 2017

Laboratory Identification:

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

Summary

Sample receipt The sample arrived at GEL Laboratories LLC, Charleston, South Carolina on October 27, 2017 for analysis. The sample was delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was checked, documented, and within specifications. Shipping container temperature was within specification (0 - 6C). There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following sample:

<u>Laboratory ID</u>	<u>Client ID</u>
439255001	CAPA-18-147581

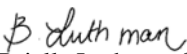
Case Narrative

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.

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.


Brielle Luthman for
Valerie Davis
Project Manager

List of current GEL Certifications as of 08 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	SC000122017-24
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Chain of Custody and Supporting Documentation

General Engineering		COC/Lab Request #:	
Charleston SC		2018-584	
		Page 1 of 1	
Chain of Custody/Analysis Request		COC/Lab Request #:	
Client Contact:		2018-584	
Lab Agreement #:		Page 1 of 1	
Project Number: ADEP			
Analysis Turnaround Time:			
24 Hour - <input type="checkbox"/> Other - <input type="checkbox"/>			
7 Days - <input type="checkbox"/>			
14 Days - <input type="checkbox"/>			
21 Days - <input type="checkbox"/>			
28 Days - <input checked="" type="checkbox"/>			
Field Sample ID	Sample Date	Sample Time	Sample Matrix
CAPA-18-147550	Oct 25 2017	09:44	W
CAPA-18-147576	Oct 25 2017	09:44	W
CAPA-18-147606	Oct 25 2017	09:44	W
CAMO-18-147635	Oct 25 2017	13:50	W
CAMO-18-147650	Oct 25 2017	13:50	W
CAMO-18-147672	Oct 25 2017	13:50	W
CAMO-18-147678	Oct 25 2017	13:50	W
CAMO-18-147680	Oct 25 2017	13:50	W
CAMO-18-147683	Oct 25 2017	13:50	W
CAPA-18-147555	Oct 25 2017	11:51	W
CAPA-18-147581	Oct 25 2017	11:51	W
CAPA-18-147608	Oct 25 2017	11:51	W
Special Instructions:			
Relinquished by: <i>[Signature]</i>		Print Name: <i>Matthew</i>	
Relinquished by:		Print Name:	
Relinquished by:		Print Name:	

COL: 2010-207

700403

TEST - Explosives		YES	NO
Samples collected from a WFO area?			
Field Test for Explosives Results		YES	NO
Spot test shows presence of explosives residues. If YES - Do not ship.			

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?				
Sample Activity (dpm/100cm ²)	Shipment Activity (dpm*g/100cm ²)	Sampled Location	YES	NO
Alpha detectable	Alpha >160,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49		
Alpha > 125	Alpha >1,250,000	other locations		
Beta > 1,500	Beta >15,000,000	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?		X	
Sample Activity (pCi/g)	Shipment Activity (pCi)	YES	NO
• Am-241 > 27	• Am-241 > 270,000		
• Cs-137 > 270	• Cs-137 > 270,000		
• Pu-238 > 27	• Pu-238 > 270,000		
• Pu-239/240 > 27	• Pu-239/240 > 270,000		
• Th-228 > 27	• Th-228 > 270,000		
• U-234 > 270	• U-234 > 1,600,000,000		
• U-238 > 270	• U-238 > unlimited		
• H-3 > 27,000,000	• H-3 > 27,000,000,000		X
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	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.				
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.				

HOLD SAMPLES FOR ANALYSIS	
The samples are held per ER-SOP-10094, Rev. 1, 5.2.2 [7]	

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) MATT ENGLERT	10-26-17
(Signature) <i>M. Englert</i>	1500

Hazard Assessment Reviewed By:	Date/Time
(Printed Name) <i>Miss-Maria</i>	10/26/17
(Signature) <i>[Signature]</i>	300



Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: <u>ESHLC</u>		SDG/AR/COC/Work Order: <u>4304/03</u>	
Received By: <u>ZKW</u>		Date Received: <u>10/27/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1783 0596-15°C (rchem)</u> <u>5908 1783 0622-1°C</u> <u>5908 1783 0620-1°C</u> <u>5908 1783 0621-1°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM/mR/Hr Classified as: Rad 1 Rnd 2 Rnd 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 Criterion	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 <input type="checkbox"/> None Other: _____ *all temperatures are recorded in Celsius TEMP: <u>5°F above</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR3-16</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: _____ If Preservation added, Lot#: _____
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes _____ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No _____ N/A _____ (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No _____ N/A _____ Sample ID's and containers affected: _____
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: _____
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected: _____
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: _____
11 Number of containers received match number indicated on COC?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's affected: <u>See Below</u>
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 rec'd WST15-17-148252 for VOA collected 10/18/17 @ 11:30
* We rec'd CAPU-18-148326 for TAL Metals, AM 241 + GS + PU +
SE90 collected 10/25/17 @ 10:50
* We only rec'd 2 containers for -147262 and -147263

PM (or PMA) review: Initials JBSDate 10/30/2017 Page 1 of 1

GL-CHL-SR-001 Rev 5

(505) 665-9966

SHIP DATE: 26OCT17
ACTWGT: 59.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

ORIGIN: KEITH GREENE
LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOARSGW04BAGWSO



FedEx Express



FRI - 27 OCT 10:30
PRIORITY OVERNIGHT

TRK# 5908 1783 0622
[0201]

X7 RBWA

29407
SC-US CHS



Part # 155140V-434 R1T2 06/15 23

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: 26OCT17
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOARSGW04BAGWSO



FedEx Express



FRI - 27 OCT 10:30
PRIORITY OVERNIGHT

1 of 3
TRK# 5908 1783 0596
[0201]

MASTER

V7 RRWA

29407
SC-US CHS

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

SHIP DATE: 26OCT17
ACTWGT: 45.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM 87545
UNITED STATES US

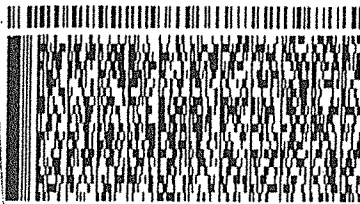
BILL SENDER

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GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOARSGW04BAGWSO



FedEx Express



FRI - 27 OCT 10:
PRIORITY OVERNIGHT

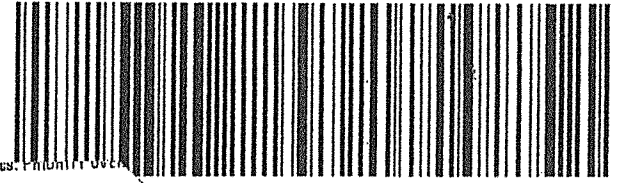
3 of 3
MPS# 5908 1783 0611
[0263]

Mstr# 5908 1783 0596

[0201]

X7 RBWA

294
SC-US C



ORIGIN ID: SAFA
KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237

SHIP DATE: 26OCT17
ACTWGT: 46.0 LB MAN
CAD: 0014176/CAFE2916

LOS ALAMOS, NM
UNITED STATES US

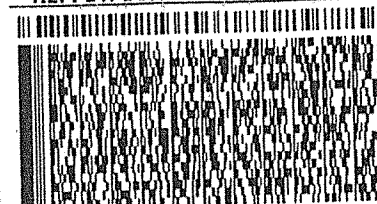
BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 21PDOARSGW04BAGWSO



FedEx Express



FRI - 27 OCT 10
PRIORITY OVERNIGHT

2 of 3
MPS# 5908 1783 0600
[0263]

Mstr# 5908 1783 0596

[0201]

X7 RBWA

29
SC-US

Subject: FW: reanalysis requests
From: "Patel, Nita" <npatel@lanl.gov>
Date: 12/4/2017 1:41 PM
To: Valerie Davis <vsd@gel.com>

From: Ding, Mei
Sent: Monday, December 4, 2017 11:27:16 AM
To: Patel, Nita; Mark, Paul
Cc: Marczak, Stanislaw; Cygnarowicz, Robert Michael; Katzman, Danny
Subject: reanalysis requests

Hello Nita and Paul,

Would you have the following two samples reanalyzed.

1. CAPA-18-147581, Bis(2-ethylhexyl)phthalate

Current result (7.6 ug/l) is above EPA STD. interesting thing is that this well (R-39), Bis(2-ethylhexyl)phthalate in initial sample (9.8 ug/L) was also above EPA STD from last year, but reanalysis result was dropped to 3.53 ug/L.

2. CAMO-18-147681, Chromium

Chromium concentration in this location (R-45 S2) is jumped to 42.5 ug/L (doubled from previous values). This chromium concentration is close to that of in R-45 S1. I wondered if the lab has exchanged the samples.

Thanks,

mei

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.

Semi-Volatile Analysis

Case Narrative

**GC/MS Semivolatile
Technical Case Narrative
ARS International, LLC (ARSL)
SDG #: 2018-584-1
Work Order #: 439255**

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:	1724120
Prep Batch Number:	1724119

Sample Analysis

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

Sample ID	Client ID
439255001	CAPA-18-147581
1203933005	Method Blank (MB)
1203933006	Laboratory Control Sample (LCS)
1203933007	Laboratory Control Sample Duplicate (LCSD)

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 used in place of matrix QC due to limited sample volume.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD values between the LCS and LCSD met the acceptance limits.

QC Sample Designation

A matrix spike/matrix spike duplicate pair was not extracted and analyzed with this batch for this SDG.

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

Sample (See Below) was received within holding, but extracted out of holding. The sample was analyzed and the data have been reported and qualified accordingly.

Sample	Value
439255001 (CAPA-18-147581)	Relogged 05-DEC-17, out of holding 01-NOV-17

Preparation/Analytical Method Verification

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

Sample Dilutions

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

Sample Re-extraction/Re-analysis

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

Miscellaneous Information:**Manual Integrations**

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

TIC Comment

Tentatively identified compounds (TIC) were requested for sample 439255001 (CAPA-18-147581) in this SDG in this batch.

Additional Comments

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

Electronic Package Comment

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

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

System Configuration

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2018-584-1 GEL Work Order: 439255

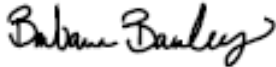
The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- h Preparation or preservation holding time was exceeded
- 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: 08 DEC 2017

Title: Data Validator

Sample Data Summary

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

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SDG Number: 2018-584-1
Lab Sample ID: 439255001
Client Sample: VOA,SVOA-Relog from 436463015
Client ID: CAPA-18-147581
Batch ID: 1724120
Run Date: 12/08/2017 00:08
Prep Date: 12/07/2017 10:25
Data File: s120717.B\s4L0727.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 910 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
95-94-3	1,2,4,5-Tetrachlorobenzene	Uh	3.30	ug/L	3.30	11.0
120-82-1	1,2,4-Trichlorobenzene	Uh	3.30	ug/L	3.30	11.0
95-50-1	1,2-Dichlorobenzene	Uh	3.30	ug/L	3.30	11.0
122-66-7	Azobenzene	Uh	3.30	ug/L	3.30	11.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	Uh	3.30	ug/L	3.30	11.0
106-46-7	1,4-Dichlorobenzene	Uh	3.30	ug/L	3.30	11.0
123-91-1	1,4-Dioxane	Uh	3.30	ug/L	3.30	11.0
90-12-0	1-Methylnaphthalene	Uh	0.330	ug/L	0.330	1.10
58-90-2	2,3,4,6-Tetrachlorophenol	Uh	3.30	ug/L	3.30	11.0
95-95-4	2,4,5-Trichlorophenol	Uh	3.30	ug/L	3.30	11.0
88-06-2	2,4,6-Trichlorophenol	Uh	3.30	ug/L	3.30	11.0
120-83-2	2,4-Dichlorophenol	Uh	3.30	ug/L	3.30	11.0
105-67-9	2,4-Dimethylphenol	Uh	3.30	ug/L	3.30	11.0
51-28-5	2,4-Dinitrophenol	Uh	5.49	ug/L	5.49	22.0
121-14-2	2,4-Dinitrotoluene	Uh	3.30	ug/L	3.30	11.0
606-20-2	2,6-Dinitrotoluene	Uh	3.30	ug/L	3.30	11.0
91-58-7	2-Chloronaphthalene	Uh	0.451	ug/L	0.451	1.10
95-57-8	2-Chlorophenol	Uh	3.30	ug/L	3.30	11.0
534-52-1	2-Methyl-4,6-dinitrophenol	Uh	3.30	ug/L	3.30	11.0
91-57-6	2-Methylnaphthalene	Uh	0.330	ug/L	0.330	1.10
88-75-5	2-Nitrophenol	Uh	3.30	ug/L	3.30	11.0
91-94-1	3,3'-Dichlorobenzidine	Uh	3.30	ug/L	3.30	11.0
101-55-3	4-Bromophenylphenylether	Uh	3.30	ug/L	3.30	11.0
59-50-7	Parachlorometa cresol	Uh	3.30	ug/L	3.30	11.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	Uh	3.63	ug/L	3.63	11.0
7005-72-3	4-Chlorophenylphenylether	Uh	3.30	ug/L	3.30	11.0
100-02-7	4-Nitrophenol	Uh	3.30	ug/L	3.30	11.0
83-32-9	Acenaphthene	Uh	0.330	ug/L	0.330	1.10
208-96-8	Acenaphthylene	Uh	0.330	ug/L	0.330	1.10
62-53-3	Aniline	Uh	4.62	ug/L	4.62	11.0
120-12-7	Anthracene	Uh	0.330	ug/L	0.330	1.10
1912-24-9	Atrazine	Uh	3.30	ug/L	3.30	11.0
92-87-5	Benzidine	Uh	4.29	ug/L	4.29	11.0
56-55-3	Benzo(a)anthracene	Uh	0.330	ug/L	0.330	1.10
50-32-8	Benzo(a)pyrene	Uh	0.330	ug/L	0.330	1.10
205-99-2	Benzo(b)fluoranthene	Uh	0.330	ug/L	0.330	1.10
191-24-2	Benzo(ghi)perylene	Uh	0.330	ug/L	0.330	1.10

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

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SDG Number: 2018-584-1
Lab Sample ID: 439255001
Client Sample: VOA,SVOA-Relog from 436463015
Client ID: CAPA-18-147581
Batch ID: 1724120
Run Date: 12/08/2017 00:08
Prep Date: 12/07/2017 10:25
Data File: s120717.B\s4L0727.D

Date Collected: 10/25/2017 11:51
Date Received: 10/27/2017 08:55
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD4.I
Analyst: JMB3
Aliquot: 910 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	Uh	0.330	ug/L	0.330	1.10
65-85-0	Benzoic acid	Uh	6.59	ug/L	6.59	22.0
100-51-6	Benzyl alcohol	Uh	3.30	ug/L	3.30	11.0
85-68-7	Butylbenzylphthalate	Uh	3.30	ug/L	3.30	11.0
218-01-9	Chrysene	Uh	0.330	ug/L	0.330	1.10
84-74-2	Di-n-butylphthalate	Uh	3.30	ug/L	3.30	11.0
117-84-0	Di-n-octylphthalate	Uh	3.30	ug/L	3.30	11.0
53-70-3	Dibenzo(a,h)anthracene	Uh	0.330	ug/L	0.330	1.10
132-64-9	Dibenzofuran	Uh	3.30	ug/L	3.30	11.0
84-66-2	Diethylphthalate	Uh	3.30	ug/L	3.30	11.0
131-11-3	Dimethylphthalate	Uh	3.30	ug/L	3.30	11.0
88-85-7	Dinoseb	Uh	3.30	ug/L	3.30	11.0
122-39-4	Diphenylamine	Uh	3.30	ug/L	3.30	11.0
206-44-0	Fluoranthene	Uh	0.330	ug/L	0.330	1.10
86-73-7	Fluorene	Uh	0.330	ug/L	0.330	1.10
118-74-1	Hexachlorobenzene	Uh	3.30	ug/L	3.30	11.0
87-68-3	Hexachlorobutadiene	Uh	3.30	ug/L	3.30	11.0
77-47-4	Hexachlorocyclopentadiene	Uh	3.30	ug/L	3.30	11.0
67-72-1	Hexachloroethane	Uh	3.30	ug/L	3.30	11.0
193-39-5	Indeno(1,2,3-cd)pyrene	Uh	0.330	ug/L	0.330	1.10
78-59-1	Isophorone	Uh	3.85	ug/L	3.85	11.0
62-75-9	N-Methyl-N-nitrosomethylamine	Uh	3.30	ug/L	3.30	11.0
924-16-3	N-Nitrosodi-n-butylamine	Uh	3.30	ug/L	3.30	11.0
55-18-5	N-Nitrosodiethylamine	Uh	3.30	ug/L	3.30	11.0
621-64-7	N-Nitrosodi-n-propylamine	Uh	3.30	ug/L	3.30	11.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	Uh	3.30	ug/L	3.30	11.0
91-20-3	Naphthalene	Uh	0.330	ug/L	0.330	1.10
98-95-3	Nitrobenzene	Uh	3.30	ug/L	3.30	11.0
608-93-5	Pentachlorobenzene	Uh	3.30	ug/L	3.30	11.0
87-86-5	Pentachlorophenol	Uh	3.30	ug/L	3.30	11.0
85-01-8	Phenanthrene	Uh	0.330	ug/L	0.330	1.10
108-95-2	Phenol	Uh	3.30	ug/L	3.30	11.0
129-00-0	Pyrene	Uh	0.330	ug/L	0.330	1.10
110-86-1	Pyridine	Uh	3.30	ug/L	3.30	11.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	Uh	3.30	ug/L	3.30	11.0
111-91-1	bis(2-Chloroethoxy)methane	Uh	3.30	ug/L	3.30	11.0
111-44-4	bis(2-Chloroethyl) ether	Uh	3.30	ug/L	3.30	11.0
117-81-7	bis(2-Ethylhexyl)phthalate	Uh	3.30	ug/L	3.30	11.0

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

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SDG Number: 2018-584-1	Date Collected: 10/25/2017 11:51	Matrix: W
Lab Sample ID: 439255001	Date Received: 10/27/2017 08:55	
Client Sample: VOA,SVOA-Relog from 436463015	Client: ARSL004	Project: ESHL00114
Client ID: CAPA-18-147581	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1724120	Inst: MSD4.I	Dilution: 1
Run Date: 12/08/2017 00:08	Analyst: JMB3	Inj. Vol: 1 uL
Prep Date: 12/07/2017 10:25	Aliquot: 910 mL	Final Volume: 1 mL
Data File: s120717.B\s4L0727.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols	Uh	4.07	ug/L	4.07	11.0
99-09-2	3-Nitroaniline	Uh	3.30	ug/L	3.30	11.0
95-48-7	<i>m</i> -Nitroaniline o-Cresol	Uh	3.30	ug/L	3.30	11.0
88-74-4	2-Nitroaniline	Uh	3.30	ug/L	3.30	11.0
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	Uh	3.30	ug/L	3.30	11.0

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	74.2	110	ug/L 68	(32%-124%)
2-Fluorobiphenyl	34.6	54.9	ug/L 63	(32%-112%)
2-Fluorophenol	50.2	110	ug/L 46	(15%-88%)
Nitrobenzene-d5	37.1	54.9	ug/L 67	(36%-115%)
Phenol-d5	30.9	110	ug/L 28	(15%-91%)
p-Terphenyl-d14	45.7	54.9	ug/L 83	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	1.853	6.27	ug/L	99	NJ
	unknown	16.62	8.42	ug/L	0	J

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

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SDG Number: 2018-584-1

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203933005	MB for batch 1724119	45	26	70	67	67	71
1203933006	LCS for batch 1724119	47	28	72	72	70	80
1203933007	LCSD for batch 1724119	47	28	74	72	72	77
439255001	CAPA-18-147581	46	28	67	63	68	83

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

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1724119

Matrix: WATER

Lab Sample ID 1203933006

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:11

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

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	24.9	50	30-88
110-86-1	LCS Pyridine	50.0	0.0	26.8	54	27-89
62-53-3	LCS Aniline	50.0	0.0	37.0	74	49-112
108-95-2	LCS Phenol	50.0	0.0	15.0	30	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	40.1	80	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	37.4	75	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	32.0	64	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	31.9	64	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	33.6	67	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)ether	50.0	0.0	41.9	84	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	35.4	71	44-102
95-48-7	LCS o-Cresol	50.0	0.0	33.4	67	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	32.6	65	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	40.6	81	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	30.8	62	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	36.7	73	53-115
78-59-1	LCS Isophorone	50.0	0.0	36.5	73	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	39.1	78	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	32.9	66	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	39.1	78	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	39.4	79	53-109
65-85-0	LCS Benzoic acid	100	0.0	33.2	33	21-74

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1724119

Matrix: WATER

Lab Sample ID 1203933006

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:11

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

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	47.5	95	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	30.5	61	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	38.6	77	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	35.1	70	42-103
91-20-3	LCS Naphthalene	50.0	0.0	34.8	70	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	36.0	72	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	25.8	52	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	36.5	73	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	39.8	80	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	34.8	70	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	37.4	75	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	50.4	101	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	39.7	79	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	39.2	78	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	40.3	81	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	36.9	74	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	38.8	78	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	28.2	56	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	37.2	74	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	35.3	71	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	40.1	80	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	7.80	16	15-137

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1724119

Matrix: WATER

Lab Sample ID 1203933006

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:11

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

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	37.8	76	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	40.5	81	52-121
100-01-6	LCS 4-Nitroaniline	50.0	0.0	44.9	90	44-137
	<i>p</i> -Nitroaniline					
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	38.7	77	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	35.0	70	55-113
122-66-7	LCS Azobenzene	50.0	0.0	36.3	73	53-115
	<i>1,2-Diphenylhydrazine</i>					
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	37.5	75	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	36.0	72	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	30.3	61	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	38.0	76	55-110
120-12-7	LCS Anthracene	50.0	0.0	38.5	77	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	39.6	79	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	38.8	78	54-118
129-00-0	LCS Pyrene	50.0	0.0	36.7	73	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	37.5	75	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	37.2	74	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	39.0	78	57-112
218-01-9	LCS Chrysene	50.0	0.0	40.6	81	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	36.9	74	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	39.6	79	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	40.7	81	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	39.6	79	40-118

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1724119

Matrix: WATER

Lab Sample ID 1203933006

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:11

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

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	38.7	77	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	39.6	79	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	37.0	74	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	27.6	55	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	40.8	82	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	34.7	69	44-102
1912-24-9	LCS Atrazine	50.0	0.0	41.5	83	60-131
92-87-5	LCS Benzidine	100	0.0	55.9	56	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	42.8	86	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	34.6	69	39-99

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1724119

Matrix: WATER

Lab Sample ID 1203933007

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:40

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	LCSD N-Methyl-N-nitrosomethylamine	50.0	0.0	25.2	50	30-88	1	0-30
110-86-1	LCSD Pyridine	50.0	0.0	24.8	50	27-89	8	0-30
62-53-3	LCSD Aniline	50.0	0.0	35.6	71	49-112	4	0-30
108-95-2	LCSD Phenol	50.0	0.0	15.0	30	16-82	1	0-30
111-44-4	LCSD bis(2-Chloroethyl) ether	50.0	0.0	40.2	80	51-111	0	0-30
95-57-8	LCSD 2-Chlorophenol	50.0	0.0	37.0	74	49-105	1	0-30
541-73-1	LCSD 1,3-Dichlorobenzene	50.0	0.0	30.9	62	37-95	3	0-30
106-46-7	LCSD 1,4-Dichlorobenzene	50.0	0.0	31.2	62	38-96	2	0-30
95-50-1	LCSD 1,2-Dichlorobenzene	50.0	0.0	33.0	66	39-97	2	0-30
108-60-1	LCSD bis(2-Chloro-1-methylethyl)ether	50.0	0.0	42.0	84	44-123	0	0-30
100-51-6	LCSD Benzyl alcohol	50.0	0.0	35.2	70	44-102	1	0-30
95-48-7	LCSD o-Cresol	50.0	0.0	32.7	65	41-101	2	0-30
65794-96-9	LCSD m,p-Cresols	50.0	0.0	32.3	65	43-102	1	0-30
621-64-7	LCSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	39.4	79	54-115	3	0-30
67-72-1	LCSD Hexachloroethane	50.0	0.0	29.8	60	36-96	3	0-30
98-95-3	LCSD Nitrobenzene	50.0	0.0	37.5	75	53-115	2	0-30
78-59-1	LCSD Isophorone	50.0	0.0	36.8	74	56-117	1	0-30
88-75-5	LCSD 2-Nitrophenol	50.0	0.0	40.7	81	51-113	4	0-30
105-67-9	LCSD 2,4-Dimethylphenol	50.0	0.0	31.9	64	51-104	3	0-30
111-91-1	LCSD bis(2-Chloroethoxy)methane	50.0	0.0	40.2	80	55-114	3	0-30
120-83-2	LCSD 2,4-Dichlorophenol	50.0	0.0	39.8	80	53-109	1	0-30
65-85-0	LCSD Benzoic acid	100	0.0	37.3	37	21-74	11	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1724119

Matrix: WATER

Lab Sample ID 1203933007

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:40

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	LCSD 4-Chloroaniline	50.0	0.0	46.6	93	65-136	2	0-30
87-68-3	LCSD Hexachlorobutadiene	50.0	0.0	30.4	61	35-98	0	0-30
59-50-7	LCSD Parachlorometa cresol <i>4-Chloro-3-methylphenol</i>	50.0	0.0	38.6	77	55-115	0	0-30
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	34.5	69	42-103	2	0-30
91-20-3	LCSD Naphthalene	50.0	0.0	35.5	71	44-102	2	0-30
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	35.9	72	45-108	0	0-30
77-47-4	LCSD Hexachlorocyclopentadiene	50.0	0.0	27.7	55	34-89	7	0-30
88-06-2	LCSD 2,4,6-Trichlorophenol	50.0	0.0	37.3	75	55-120	2	0-30
95-95-4	LCSD 2,4,5-Trichlorophenol	50.0	0.0	40.6	81	55-116	2	0-30
91-58-7	LCSD 2-Chloronaphthalene	50.0	0.0	35.7	71	44-107	3	0-30
88-74-4	LCSD 2-Nitroaniline <i>o-Nitroaniline</i>	50.0	0.0	38.0	76	53-121	2	0-30
99-09-2	LCSD 3-Nitroaniline <i>m-Nitroaniline</i>	50.0	0.0	51.1	102	61-139	1	0-30
131-11-3	LCSD Dimethylphthalate	50.0	0.0	40.7	81	60-122	3	0-30
606-20-2	LCSD 2,6-Dinitrotoluene	50.0	0.0	39.9	80	59-122	2	0-30
121-14-2	LCSD 2,4-Dinitrotoluene	50.0	0.0	40.7	81	57-124	1	0-30
208-96-8	LCSD Acenaphthylene	50.0	0.0	37.5	75	50-113	2	0-30
83-32-9	LCSD Acenaphthene	50.0	0.0	39.6	79	49-112	2	0-30
51-28-5	LCSD 2,4-Dinitrophenol	50.0	0.0	30.8	62	34-122	9	0-30
132-64-9	LCSD Dibenzofuran	50.0	0.0	37.9	76	50-111	2	0-30
58-90-2	LCSD 2,3,4,6-Tetrachlorophenol	50.0	0.0	36.3	73	54-122	3	0-30
84-66-2	LCSD Diethylphthalate	50.0	0.0	41.7	83	57-122	4	0-30
100-02-7	LCSD 4-Nitrophenol	50.0	0.0	8.43	17	15-137	8	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1724119

Matrix: WATER

Lab Sample ID 1203933007

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:40

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	LCSD Fluorene	50.0	0.0	38.3	77	52-114	1	0-30
7005-72-3	LCSD 4-Chlorophenylphenylether	50.0	0.0	41.6	83	52-121	3	0-30
100-01-6	LCSD 4-Nitroaniline <i>p</i> -Nitroaniline	50.0	0.0	47.2	94	44-137	5	0-30
534-52-1	LCSD 2-Methyl-4,6-dinitrophenol	50.0	0.0	42.4	85	45-124	9	0-30
122-39-4	LCSD Diphenylamine	50.0	0.0	36.3	73	55-113	4	0-30
122-66-7	LCSD Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	37.3	75	53-115	3	0-30
101-55-3	LCSD 4-Bromophenylphenylether	50.0	0.0	39.1	78	54-116	4	0-30
118-74-1	LCSD Hexachlorobenzene	50.0	0.0	38.1	76	54-115	6	0-30
87-86-5	LCSD Pentachlorophenol	50.0	0.0	33.4	67	41-116	10	0-30
85-01-8	LCSD Phenanthrene	50.0	0.0	39.3	79	55-110	3	0-30
120-12-7	LCSD Anthracene	50.0	0.0	40.1	80	56-112	4	0-30
84-74-2	LCSD Di-n-butylphthalate	50.0	0.0	43.2	86	57-123	9	0-30
206-44-0	LCSD Fluoranthene	50.0	0.0	43.4	87	54-118	11	0-30
129-00-0	LCSD Pyrene	50.0	0.0	35.3	71	49-121	4	0-30
85-68-7	LCSD Butylbenzylphthalate	50.0	0.0	37.8	76	52-125	1	0-30
117-81-7	LCSD bis(2-Ethylhexyl)phthalate	50.0	0.0	36.6	73	52-125	2	0-30
56-55-3	LCSD Benzo(a)anthracene	50.0	0.0	40.4	81	57-112	3	0-30
218-01-9	LCSD Chrysene	50.0	0.0	41.8	84	58-117	3	0-30
117-84-0	LCSD Di-n-octylphthalate	50.0	0.0	35.9	72	50-129	3	0-30
205-99-2	LCSD Benzo(b)fluoranthene	50.0	0.0	42.1	84	41-118	6	0-30
207-08-9	LCSD Benzo(k)fluoranthene	50.0	0.0	43.1	86	42-121	6	0-30
50-32-8	LCSD Benzo(a)pyrene	50.0	0.0	40.6	81	40-118	3	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2018-584-1

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1724119

Matrix: WATER

Lab Sample ID 1203933007

Instrument: MSD4.I

Analysis Date: 12/07/2017 23:40

Dilution: 1

Analyst: JMB3

Prep Batch ID: 1724119

Inj. Vol: 1 uL

Batch ID: 1724120

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	50.0	0.0	37.7	75	34-125	2	0-30
53-70-3	LCSD Dibenzo(a,h)anthracene	50.0	0.0	38.4	77	38-129	3	0-30
191-24-2	LCSD Benzo(ghi)perylene	50.0	0.0	35.8	72	33-131	3	0-30
123-91-1	LCSD 1,4-Dioxane	50.0	0.0	27.1	54	38-78	2	0-30
930-55-2	LCSD N-Nitrosopyrrolidine	50.0	0.0	38.4	77	54-113	6	0-30
95-94-3	LCSD 1,2,4,5-Tetrachlorobenzene	50.0	0.0	35.3	71	44-102	2	0-30
1912-24-9	LCSD Atrazine	50.0	0.0	44.1	88	60-131	6	0-30
92-87-5	LCSD Benzidine	100	0.0	67.2	67	20-144	18	0-30
91-94-1	LCSD 3,3'-Dichlorobenzidine	50.0	0.0	44.3	89	43-127	3	0-30
120-82-1	LCSD 1,2,4-Trichlorobenzene	50.0	0.0	34.4	69	39-99	1	0-30

Method Blank Summary

SDG Number:	2018-584-1	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1724119	Instrument ID:	MSD4.I	Data File:	s120717.B\s4L0724.D
Lab Sample ID:	1203933005	Prep Date:	12/07/2017 10:25	Analyzed:	12/07/17 22:43
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 1724119	1203933006	s120717.B\s4L0725.D	12/07/17	2311
02 LCSD for batch 1724119	1203933007	s120717.B\s4L0726.D	12/07/17	2340
03 CAPA-18-147581	439255001	s120717.B\s4L0727.D	12/08/17	0008

Quality Control Data

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

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SDG Number: 2018-584-1

Lab Sample ID: 1203933005

Client Sample: QC for batch 1724119

Client ID: MB for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 22:43

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0724.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
541-73-1	<i>1,2-Diphenylhydrazine</i> 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
106-47-8	<i>4-Chloro-3-methylphenol</i> 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: 2018-584-1

Lab Sample ID: 1203933005

Client Sample: QC for batch 1724119

Client ID: MB for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 22:43

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0724.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
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
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Sample Summary**

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SDG Number: 2018-584-1

Lab Sample ID: 1203933005

Client Sample: QC for batch 1724119

Client ID: MB for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 22:43

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0724.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD4.I

Analyst: JMB3

Aliquot: 1000 mL

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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
95-48-7	<i>m</i> -Nitroaniline 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
100-01-6	<i>o</i> -Nitroaniline 4-Nitroaniline <i>p</i> -Nitroaniline	U	3.00	ug/L	3.00	10.0

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	66.9	100	ug/L 67	(32%-124%)
2-Fluorobiphenyl	33.5	50.0	ug/L 67	(32%-112%)
2-Fluorophenol	44.5	100	ug/L 45	(15%-88%)
Nitrobenzene-d5	34.9	50.0	ug/L 70	(36%-115%)
Phenol-d5	25.9	100	ug/L 26	(15%-91%)
p-Terphenyl-d14	35.6	50.0	ug/L 71	(36%-121%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000079-01-6	Trichloroethylene	1.858	5.91	ug/L	99	NJ

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Sample Summary**

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SDG Number: 2018-584-1
Lab Sample ID: 1203933006
Client Sample: QC for batch 1724119
Client ID: LCS for batch 1724119
Batch ID: 1724120
Run Date: 12/07/2017 23:11
Prep Date: 12/07/2017 10:25
Data File: s120717.B\s4L0725.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		34.7	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		34.6	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		33.6	ug/L	3.00	10.0
122-66-7	Azobenzene		36.3	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		32.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		31.9	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		27.6	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		36.0	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		35.3	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		39.8	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		36.5	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		39.4	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		32.9	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		28.2	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		40.3	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		39.2	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		34.8	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		37.4	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		38.7	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		35.1	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		39.1	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		42.8	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		37.5	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		38.6	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		47.5	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		40.5	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	J	7.80	ug/L	3.00	10.0
83-32-9	Acenaphthene		38.8	ug/L	0.300	1.00
208-96-8	Acenaphthylene		36.9	ug/L	0.300	1.00
62-53-3	Aniline		37.0	ug/L	4.20	10.0
120-12-7	Anthracene		38.5	ug/L	0.300	1.00
1912-24-9	Atrazine		41.5	ug/L	3.00	10.0
92-87-5	Benzidine		55.9	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		39.0	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		39.6	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		39.6	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		37.0	ug/L	0.300	1.00

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Sample Summary**

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SDG Number: 2018-584-1

Lab Sample ID: 1203933006

Client Sample: QC for batch 1724119

Client ID: LCS for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 23:11

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0725.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
207-08-9	Benzo(k)fluoranthene		40.7	ug/L	0.300	1.00
65-85-0	Benzoic acid		33.2	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		35.4	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		37.5	ug/L	3.00	10.0
218-01-9	Chrysene		40.6	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		39.6	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		36.9	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		39.6	ug/L	0.300	1.00
132-64-9	Dibenzofuran		37.2	ug/L	3.00	10.0
84-66-2	Diethylphthalate		40.1	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		39.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		35.0	ug/L	3.00	10.0
206-44-0	Fluoranthene		38.8	ug/L	0.300	1.00
86-73-7	Fluorene		37.8	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		36.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		30.5	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		25.8	ug/L	3.00	10.0
67-72-1	Hexachloroethane		30.8	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		38.7	ug/L	0.300	1.00
78-59-1	Isophorone		36.5	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		24.9	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		40.6	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		40.8	ug/L	3.00	10.0
91-20-3	Naphthalene		34.8	ug/L	0.300	1.00
98-95-3	Nitrobenzene		36.7	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		30.3	ug/L	3.00	10.0
85-01-8	Phenanthrene		38.0	ug/L	0.300	1.00
108-95-2	Phenol		15.0	ug/L	3.00	10.0
129-00-0	Pyrene		36.7	ug/L	0.300	1.00
110-86-1	Pyridine		26.8	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		41.9	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		39.1	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		40.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		37.2	ug/L	3.00	10.0

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Sample Summary**

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SDG Number: 2018-584-1
Lab Sample ID: 1203933006
Client Sample: QC for batch 1724119
Client ID: LCS for batch 1724119
Batch ID: 1724120
Run Date: 12/07/2017 23:11
Prep Date: 12/07/2017 10:25
Data File: s120717.B\s4L0725.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
65794-96-9	m,p-Cresols		32.6	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		50.4	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		33.4	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		37.4	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		44.9	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	70.0	100	ug/L	70	(32%-124%)
2-Fluorobiphenyl	35.9	50.0	ug/L	72	(32%-112%)
2-Fluorophenol	47.1	100	ug/L	47	(15%-88%)
Nitrobenzene-d5	36.0	50.0	ug/L	72	(36%-115%)
Phenol-d5	28.2	100	ug/L	28	(15%-91%)
p-Terphenyl-d14	39.8	50.0	ug/L	80	(36%-121%)

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

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SDG Number: 2018-584-1

Lab Sample ID: 1203933007

Client Sample: QC for batch 1724119

Client ID: LCSD for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 23:40

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0726.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		35.3	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		34.4	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		33.0	ug/L	3.00	10.0
122-66-7	Azobenzene		37.3	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		30.9	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		31.2	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		27.1	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		35.9	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		36.3	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		40.6	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		37.3	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		39.8	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		31.9	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		30.8	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		40.7	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		39.9	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		35.7	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		37.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		42.4	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		34.5	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		40.7	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		44.3	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		39.1	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		38.6	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		46.6	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		41.6	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	J	8.43	ug/L	3.00	10.0
83-32-9	Acenaphthene		39.6	ug/L	0.300	1.00
208-96-8	Acenaphthylene		37.5	ug/L	0.300	1.00
62-53-3	Aniline		35.6	ug/L	4.20	10.0
120-12-7	Anthracene		40.1	ug/L	0.300	1.00
1912-24-9	Atrazine		44.1	ug/L	3.00	10.0
92-87-5	Benzidine		67.2	ug/L	3.90	10.0
56-55-3	Benzo(a)anthracene		40.4	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		40.6	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		42.1	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		35.8	ug/L	0.300	1.00

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Sample Summary**

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SDG Number: 2018-584-1

Lab Sample ID: 1203933007

Client Sample: QC for batch 1724119

Client ID: LCSD for batch 1724119

Batch ID: 1724120

Run Date: 12/07/2017 23:40

Prep Date: 12/07/2017 10:25

Data File: s120717.B\s4L0726.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
207-08-9	Benzo(k)fluoranthene		43.1	ug/L	0.300	1.00
65-85-0	Benzoic acid		37.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		35.2	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		37.8	ug/L	3.00	10.0
218-01-9	Chrysene		41.8	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		43.2	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		35.9	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		38.4	ug/L	0.300	1.00
132-64-9	Dibenzofuran		37.9	ug/L	3.00	10.0
84-66-2	Diethylphthalate		41.7	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		40.7	ug/L	3.00	10.0
88-85-7	Dinoseb	U	3.00	ug/L	3.00	10.0
122-39-4	Diphenylamine		36.3	ug/L	3.00	10.0
206-44-0	Fluoranthene		43.4	ug/L	0.300	1.00
86-73-7	Fluorene		38.3	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		38.1	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		30.4	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		27.7	ug/L	3.00	10.0
67-72-1	Hexachloroethane		29.8	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		37.7	ug/L	0.300	1.00
78-59-1	Isophorone		36.8	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		25.2	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		39.4	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		38.4	ug/L	3.00	10.0
91-20-3	Naphthalene		35.5	ug/L	0.300	1.00
98-95-3	Nitrobenzene		37.5	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	3.00	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		33.4	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.3	ug/L	0.300	1.00
108-95-2	Phenol		15.0	ug/L	3.00	10.0
129-00-0	Pyrene		35.3	ug/L	0.300	1.00
110-86-1	Pyridine		24.8	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		42.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		40.2	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		40.2	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		36.6	ug/L	3.00	10.0

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Sample Summary**

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SDG Number: 2018-584-1	Matrix: WATER
Lab Sample ID: 1203933007	
Client Sample: QC for batch 1724119	Client: ARSL004
Client ID: LCSD for batch 1724119	Method: SW846 3510C/8270D
Batch ID: 1724120	Inst: MSD4.I
Run Date: 12/07/2017 23:40	Analyst: JMB3
Prep Date: 12/07/2017 10:25	Aliquot: 1000 mL
Data File: s120717.B\s4L0726.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		32.3	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		51.1	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		32.7	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		38.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		47.2	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	72.2	100	ug/L	72	(32%-124%)
2-Fluorobiphenyl	36.0	50.0	ug/L	72	(32%-112%)
2-Fluorophenol	47.3	100	ug/L	47	(15%-88%)
Nitrobenzene-d5	36.8	50.0	ug/L	74	(36%-115%)
Phenol-d5	28.1	100	ug/L	28	(15%-91%)
p-Terphenyl-d14	38.3	50.0	ug/L	77	(36%-121%)